DOCUMENT RESUME

ED 427 188 CE 078 079

AUTHOR	Sticht, Thomas G.
TITLE	Beyond 2000: Future Directions for Adult Education.
INSTITUTION	Applied Behavioral & Cognitive Sciences, Inc., San Diego, CA.
SPONS AGENCY	Office of Vocational and Adult Education (ED), Washington, DC. Div. of Adult Education and Literacy.
PUB DATE	1998-09-00
NOTE	41p.
PUB TYPE	Reports - Research (143)
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	Adult Development; *Adult Education; *Cognitive Development; Economic Change; Economic Climate; Educational Planning; *Educational Trends; Federal Legislation; *Futures (of Society); Literacy Education; Program Development; *Sociocultural Patterns; *Technological Advancement
IDENTIFIERS	*Adult Education Act

ABSTRACT

This paper provides adult educators with information they can use to produce perspectives for the future of adult education (AE). Part 1 provides a perspective on the past and present of AE that falls under the aegis of the Federal Adult Education Act of 1966 and subsequent amendments. It paints a picture of AE from the mid-1960s to the present and reveals trends in funding of and participation in AE by certain segments of the adult population. Part 2 looks at trends and activities that may exert an influence on AE in the early part of the next century: social trends such as population and demographic changes; economic trends such as globalization of the work force, nature of work, and demands for intellectual skills that have affected the delivery system for AE; technological changes such as communications and computer technologies that affect how adults seek information and education; and brain and cognitive sciences research that offers new insights about the potential for childhood and adult cognitive development over the life span and intergenerational transfer of language and other cognitive skills. Part 3 examines government and legislative trends that reflect the idea of "devolution" of responsibility from the federal to the state and local levels. Part 4 discusses planning issues involved in moving the present AE system from a marginal to a mainstream position in the educational system. It looks at new data resources and technologies for planning and program analysis. Six pages of notes and literature citations are appended. (YLB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

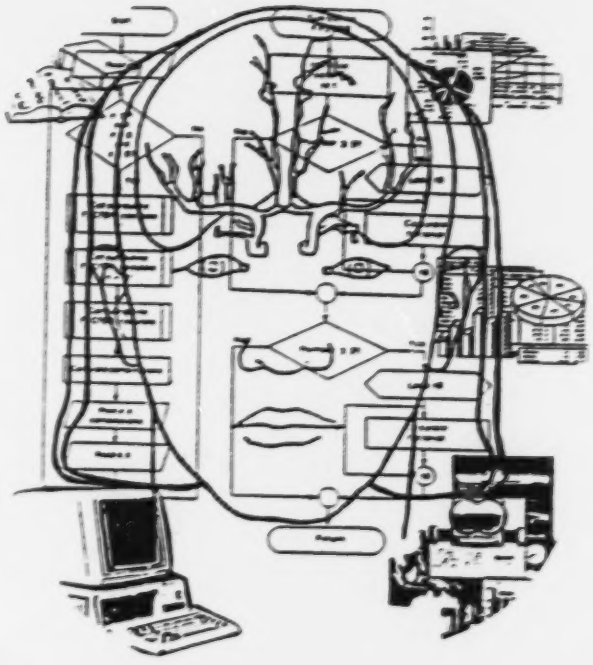
T Sticht

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

ED 427 188

Beyond 2000:

Future Directions for Adult Education



Thomas G. Sticht
Applied Behavioral & Cognitive Sciences, Inc.

September 1998

Preparation of this report was supported by a purchase order from the U. S. Department of Education, Office of Vocational and Adult Education, Division of Adult Education and Literacy. The opinions and statements in this report do not necessarily reflect official policies, positions, or beliefs of the Applied Behavioral & Cognitive Sciences, Inc. or the U. S. Department of Education or any of its offices and divisions.

CE 078 079

BEST COPY AVAILABLE

Beyond 2000: Future Directions for Adult Education

Table of Contents

Introduction 1
Caveats 2
Research Note: Learning Disabilities, Welfare-to-Work & Adult Basic Education 2

Part 1: Perspective on the Federally Funded Adult Education Program 2
Funding and Enrollments 3
- Funds Per Enrollee 3
- Enrollments in ABE, ASE, ESL 4

Demographics 5
- Gender and Age of Adult Education Participants 5
- Ethnicity of Adult Education Participants 6
- Unemployment and Public Assistance 6

Recent Trends in Adult Education 7

Part 2: Social, Science, Economic and Technology Trends 9
Social Trends 9
- Demographics of Adult Population 9
  - Gender, Age, Ethnicity 9
  - Immigration 10
  - Educational Attainment 11
- Literacy Skills of Adults 12
  - General Trends for the Last 75 Years 12
  - Trends in Setting Standards For Adult Literacy 13

Science Trends 15
- Brain Development in Children and Adults 15
- Cognitive Science and the Literacy Development of Adults 16
- The Social Basis of Cognition and the Intergenerational Transfer of Literacy from Parents to Their Children 18

Economic Trends 20
- Globalization of the Workforce 20
- High Employment Rates 20
- Skills Demands of Work 20
- Age, Health and Economics 23

Technology Trends 25
- Research Note: Assessing Adult Literacy-Based Knowledge by Telephone 24
- Telephones 25
- Television 25
- Computers 25
- Internet and World Wide Web 26

Part 3. Government and Legislative Trends 27
- Devolution Policies 28
- Standards and Accountability 28
- Accountability in the Workforce Investment Act of 1998 29

Part 4. High Priority Planning Issues 31
- Moving From a Marginal to a Mainstream Status 31
- New Data Resources and Analytical Techniques for Planning and Program Analysis 32

Notes and Literature Citations 33

Beyond 2000: Future Directions for Adult Education

Planning for the future is a matter of looking at the past and present and then conjecturing upon one or more possible futures. This paper provides adult educators with information that they can use to produce perspectives for the future of adult education in the first decade beyond 2000. There are four major parts to this paper.

Part 1 provides a perspective on the past and present of adult education that falls under the aegis of the Federal Adult Education Act of 1966 and the various amendments to the Act made by Congress since then. The information presented here paints a picture of adult education from the mid-1960's to the present period in broad brush strokes. The purpose of this section is to reveal certain trends in the funding of and participation in adult education by certain segments of the adult population. Assuming that the past is truly prologue to the future, then the trends of adult education in the past and its present nature are suggestive of what types of trends and activities we might expect in the first ten years of the new millennium.

Part 2 looks at various social, economic, technological, neuroscience and cognitive science trends and activities that may exert an influence on adult education in the early part of the next century. Among important social trends are population and demographic changes that are and will be taking place over the next decade. Economic trends in the globalization of the workforce, the nature of work and the demands for intellectual skills have affected the present delivery system for adult education and they are likely to continue to exert an influence in the next decade. Communications and computer technologies are changing the way adults seek information and education. The explosive growth of the internet offers as yet undetermined consequences for adult education. Brain and cognitive sciences offer new insights about the potential for childhood and adult cognitive development over the life span and the intergenerational transfer of language and other cognitive skills from adults to children. These developments offer additional cause to argue for the expansion of adult education.

Part 3 examines certain government and legislative trends that reflect the general idea of "devolution" of responsibility from the federal level to the state and local levels. This general trend to emphasize the responsibility in solving pressing social problems of agencies, families, and individuals outside the federal government has been realized by such legislative activities as "block grants" to states, the shift from emphasizing "education first" to "work first" in reducing welfare roles, and greater emphasis upon performance accountability in federal programs. How all these ideas translate into future legislative decisions in a government that has shifted from working under a "deficit" to a "surplus" budget mentality is part of the task of planing for the future of adult education.

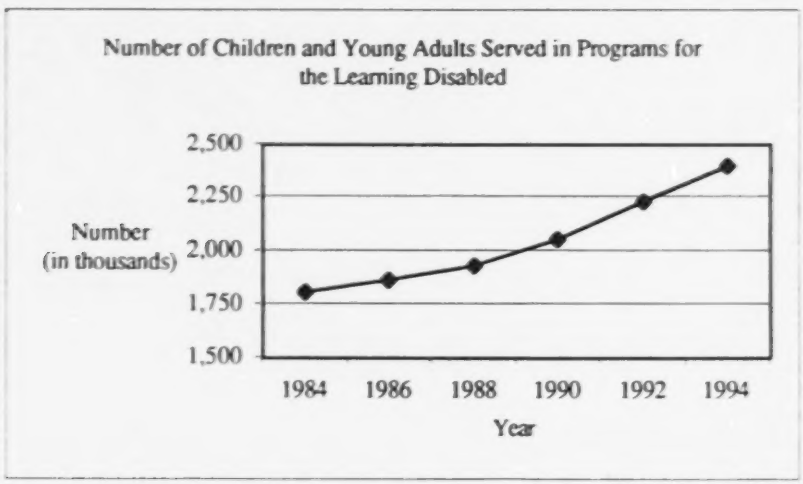
Part 4 discusses planning issues that are involved in moving the present adult education system from a marginal to a mainstream position in the U. S. educational system. It also looks briefly at new data resources and technologies for planning and program analysis.

Caveats. This report focuses upon *breadth* of coverage not *depth*. It focuses upon *national* data, and therefore may not apply to particular states or localities. It raises issues but does not resolve them. It presents many findings, but it does not attempt to explain these findings. For instance, trends regarding differences in literacy test scores among demographic groups are summarized without trying to explain the differences among groups due to socioeconomic, cultural or other factors. It is left as an exercise for readers to speculate about cause and effect, implications for their particular state and local educational policies and practices, and what actions, if any, they think should be taken in response to findings presented here

---

Research Note: Learning Disabilities, Welfare-to-Work, and Adult Basic Education

The number of children and young adults (ages 6-21) who enrolled in educational programs for the disabled increased by 32.5 percent from 1983 through 1994. Recent research suggests that as many as one-third of welfare recipients may have a learning disability (National Institute for Literacy, 1998). In March of 1998 President Clinton signed an Executive Order to expand access to education, employment, government, and private services for adults with learning disabilities. This suggest that states and localities serving welfare-to-work clients will have to develop methods for serving learning disabled welfare clients.

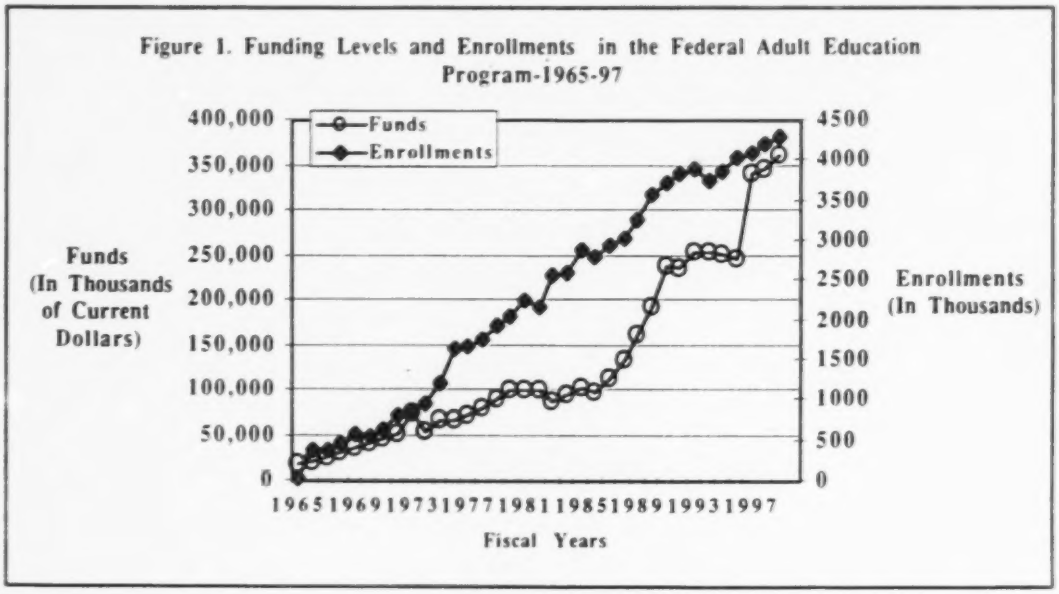


Part 1. Perspective on Adult Education Past and Present

The Adult Education Act was enacted in 1966 as a part of the Great Society programs of President Lyndon Johnson. It has continued to the present day with some modifications of its focus. In its early conception, it was aimed at helping alleviate poverty through education. It focussed on helping poorly educated adults prepare for and obtain a high school diploma as a needed credential for employment. Over the years it has broadened its focus from a more-or-less recapitulation of the K-12 education program for adults to include "life-skills" education aimed at improving adults' abilities in fulfilling their life roles as parents, citizens and workers.

Funding and Enrollments

Figure 1 shows the funding and enrollment trends for adult education from 1965 to the present era (see Notes at end of the report for sources for data). In 1965 the federal adult education program received federal funds of some $18,612,000 and enrolled 37,991 adults. By 1992 federal funds had increased to over $235,750,000 and enrollments rose to 3,880,435. Interestingly, the fastest period of funding growth seems to have taken place after 1987, a period initiated by the Bush administration with an interest on the part of adult literacy by the first lady, Mrs. Barbara Bush. However, while the funding rate accelerated rapidly, enrollments appear to have grown at a fairly constant rate.

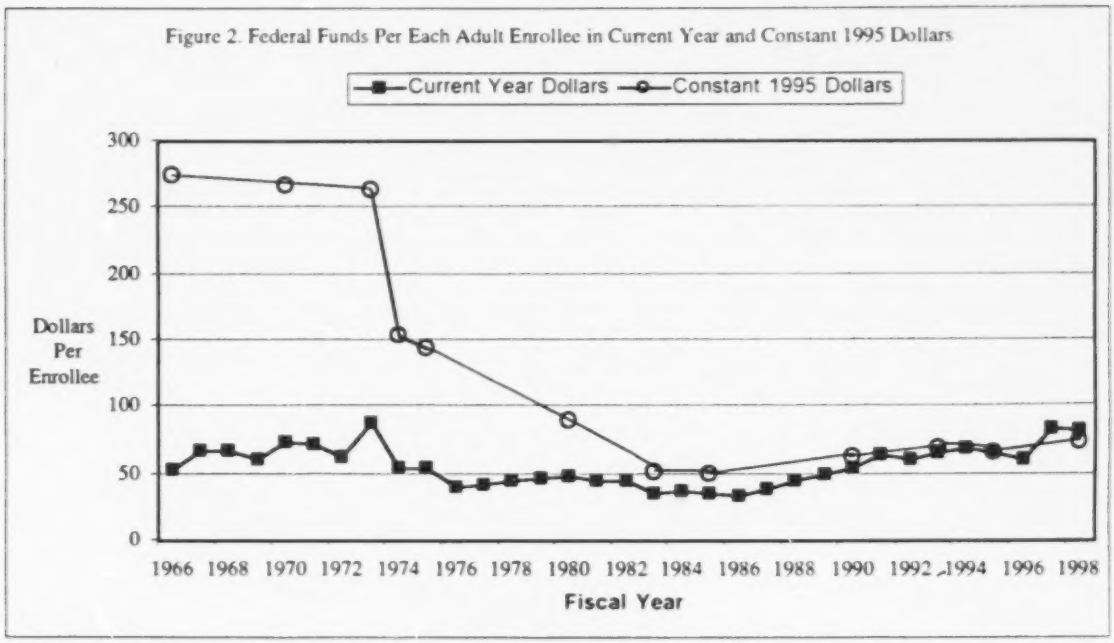


Funds Per Enrollee. When the annual federal funds are divided by the number of enrollments, the result is the amount of federal dollars per each adult enrolled during the fiscal year.

Figure 2 shows the federal funds per each adult in current and constant 1995 dollars from 1966 to 1999 (enrollment data for FY 97-99 are estimates). The data show current dollar funds per adult from $60-70 in the 1960's to 1973, when funds peaked at $88 per enrollee, and then a drop to the $40± range from the mid-1970's through the 1980's and then a return to around $60 in the early 1990's and returning to the $80s most recently.

By the late 1990s the dollars per enrollee had lost about three-quarters of their original 1966 value, dropping from about $274 per enrollee in 1966 (using constant 1995 dollars) to $73 in 1998 (274-73=201; 201/274=73.%).

Figure 2. Federal Funds Per Each Adult Enrollee in Current Year and Constant 1995 Dollars



Fortunately, this loss in federal purchasing power has been largely offset by an increase in state and local funds. Over the years, the federal funding share of adult education has declined and the share of matching funds by states and local education has increased. In 1966, federal funding for adult education was around $20 million for some 377,660 enrollees ($53 per enrollee) while state and local funding was around $10 million ($26 per enrollee) (NACAE,1980). By FY 1998, federal funds for adult education were about $345 million for some 4.2 million enrollees ($82 per enrollee) while in FY 1998 around $958 million ($228 per enrollee) were available for adult education from state and local matching funds (see Notes for sources).

Table 1. Change in federal and state funding per enrollee from 1966 to1998 (M=millions).

Funds	1966	1998
Federal	$20M $53/enrollee	$345M $82/enrollee
State	$10M $26/enrollee	$958M $228/enrollee

Enrollments in ABE, ASE, ESL. In 1980, of a total of some 2.0 million enrollees, 54.5 percent were enrolled in adult basic education (ABE), 26.3 percent in adult secondary education (ASE), and 19.2 percent in English-as-a-Second Language (ESL).

By 1996, total enrollments had doubled to around 4.0 million, and 38. 5 percent were enrolled in ABE, 22.9 percent in ASE, and 38.6 percent in ESL. In the 15 year period between 1980 and 1996, enrollments in ABE dropped by 30 percent, in ASE by 10 percent, and there was a 100 percent increase in ESL enrollments.

Demographics

The Adult Education Act of 1966 and its amendments has concentrated on adults over the age of 16 who are out of school and who do not hold a high school diploma. Amendments since 1988 have retained the age definition of adults but include a skill component in recognition of the fact that high school diploma holders may actually possess poorly developed basic literacy, numeracy and English language skills.

In 1981 the National Advisory Council on Adult Education (NACAE) reported that "there are over 53 million adults without the completion of secondary education and 23 million of that number have serious reading problems and lack the literacy necessary to function adequately in society." In 1998 the U. S. Department of Education, Division of Adult Education and Literacy published a data fact sheet indicating that according to the 1990 Census, "More than 44 million adults, or nearly 27 percent of the adult population of the United States make up the adult education target population." This suggests an almost ten million reduction in the number of adults in the original target population during the decade and a half from 1981 to 1998.

The National Governor's Association's Education Goal 6 for adult literacy is to have all adults perform at Level 3 or higher on the National Adult Literacy Survey. That survey suggested that almost half (about 48 percent) of the 191 million adults in the nation scored below the Level 3 standard. This suggests that as many as 90 million adults could be eligible for adult education based on a skills criterion. This is well above the 4.0+ million who enrolled in adult education in 1996.

Gender and Age of Adult Educaton Participants. Over the years, women have consistently outnumbered men in adult education. For instance, in 1970 men made up 43 percent and women 57 percent of enrollees. In 1980 the distribution was 44 percent men and 56 percent women and by 1993 men made up 47 and women 53 percent of enrollees.

Generally, adults who participate in adult education programs are a younger group. In 1981, 42 percent of adult enrollees were aged 16 to 24. This declined by 4 percent to 38 percent in 1988 and to 37 percent in 1996. During this time the percentage of adult education participants in the age 25-44 years range increased from 39 percent in 1981 to 46 percent in 1996. As a general trend, since 1976 over 80 percent of adult education participants have been under the age of 45 years. About 10 to 12 percent have been in the age 45 to 64 year range, and about 5 percent have been age 60 years and above.

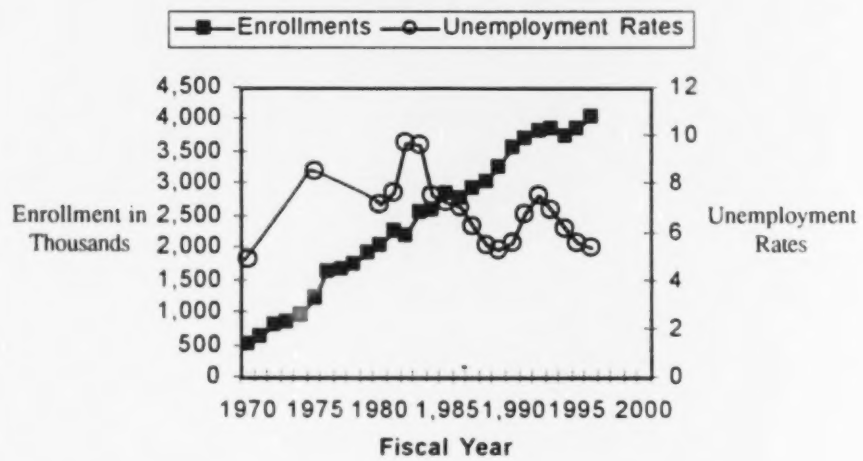
There is an interaction of age and gender in adult education enrollments such that as age increases, the percentage of women enrollees increases. In 1988, men enrollees aged 16-24 outnumbered females by about 3 percentage points, but by age 60, women outnumbered men by some 34 percent.

Ethnicity of Adult Education Participants. The general trend in adult education participants' ethnicity has seen a decline in White (non-Hispanic) and Black adults from 1979 to 1993, and an increase in Hispanic and Asian participants. White participants dropped 10 percent from 47 percent in 1979 to 36 percent in 1993, while Black enrollments dropped by 5 percent, from 23 percent in 1979 to 18 percent in 1993.

During this same time period, Hispanic enrollments rose from 21 to 31 percent, an increase of 10 percent, and Asian enrollments doubled from 7 percent in 1979 to 14 percent in 1993. These changes paralleled the changes in enrollments in ABE, ASE and ESL.

Unemployment and Public Assistance. Generally speaking, participation in adult education since 1970 has not been highly associated with unemployment rates. As Figure 3 indicates, unemployment rates increased from 1970 to the early 1980's and then began a decline-rise-decline phase from 1983 to 1996.

Figure 3. Enrollments and Unemployment Rates for Adult Education Programs 1970-1996



Despite the rises and declines in unemployment, enrollments in adult education continued at a fairly steady increase. Table 2 shows that for the years for which the data were available, the percentage of adults who enrolled and reported that they were employed ranged from a low of 24.2 in 1992 to a high of 37.1 percent in 1981. During this same time period, those adults who identified themselves as unemployed ranged from a low of 27.9 percent in 1992 to a high of 46.5 in 1981.

Table 2. Percentage of adults enrolled in adult education who were employed, unemployed, and/or on public assistance for selected years.

Years Data Available for Adult Education	U. S. Unemployment Rate	Adult Education Percent Employed	Adult Education Percent Unemployed	Adult Education Percent on Public Assistance	Adult Education Percent Reporting Status
1980	07.1	30.3	31.8	04	72
1981	07.6	37.1	46.5	06.5	100
1989	05.3	35.2	41.6	10.2	87
1990	05.6	29.2	27.1	08.8	65
1991	06.7	26.4	27.9	09.4	64
1992	07.5	24.2	33.3	11.9	69
1993	06.9	32.4	36.1	11.1	80

The last column in Table 2 indicates the percentage of enrollees for whom the data were available.

the last decade The data of Table 2 indicate that significant percentages of both employed and unemployed adults enroll in adult education, suggesting that many adults may attend adult education to get a job or improve their job opportunities (also see Orem, Giordano, & Hunsaker, 1996). The data also suggest that getting off of Public Assistance may not be one of the major reasons why adults enroll in adult education.

Recent Trends in Adult Education

The last decade has seen a number of trends in adult education that have changed the overall nature of the federally funded program. Since these trends are known to most of those who work in adult education, they are listed here with minimal elaboration.

- Growth in intergovernmental and private sector collaborations and a growing number of community based organizations has expanded the contexts for teaching adult education. Partnerships of employers, labor unions, public schools, community action organizations, and so forth have expanded the purposes, contents, and outcomes of adult education beyond the traditional high school or General Educational Development (GED) or ESL functions.

- Market segmentation has witnessed the growth of adult education providers who specialize in programs oriented toward workplaces, families, homeless, health, learning disabled, welfare clients, corrections, troubled youth, and numerous types of job training and employment programs.

- Adult learner associations for advocacy in adult education have sprung up in a number of states. There have been state and national conferences to acknowledge the struggles and achievements of adult learners. In 1998 a new national organization of adult learners was started to advocate for adult education, among other things.

- Technology has expanded in adult education with the explosion of personal computers in the 1980s and the rapid dropping of prices so that many schools, workplaces and homes are now comfortably outfitted with television sets, video

cassette recorders, telephones, cable TV, personal computers and a growing number of users of the Internet with its World Wide Web sites. This explosion in telecommunications and information technologies has stimulated a new interest in distance learning in adult education and has made it practically mandatory to include computer literacy in adult education programs.

- International comparisons of adult literacy using the International Adult Literacy Survey (IALS) have been accomplished for the first time. This forms a benchmark that allows the industrialized nations of the Organization for Economic Co-operation and Development (OECD) to track the educational development of adults over time and to assess the impacts of this development on economic and social outcomes.

Table 3. Percentage of adults in Literacy Level 1 (lowest) on the International Adult Literacy Survey (IALS Prose Scale).

Rank	Nation	Percent
1	Sweden	07.5
2	Netherlands	10.5
3	Germany	14.4
4	Canada	16.6
5	Australia	17.0
6	Switzerland (French)	17.6
7.5	Belgium (Flanders)	18.4
7.5	New Zealand	18.4
9	Switzerland (German)	19.3
10	United States	20.7
11	United Kingdom	21.8
12	Ireland	22.6
13	Poland	42.6

Part 2: Social, Science, Economic, and Technology Trends

As mentioned earlier, Part 2 looks at various social, science, economic, and technological trends and activities that may exert an influence on adult education in the early part of the next century. Among important social trends are demographic changes in the United States population that are and will be taking place over the next decade

Demographics

Bureau of the Census projections of the adult population indicate that in the year 2000 there will be some 211,718,000 adults 16 years old or older. A decade later, the over age 16 population will increase to around 233,802,000. This is a 10.4 percent increase in the adult population in the first decade of the new millennium.

Gender. Over the decade, the percentage of males and females will stay about the same, with 48 percent males and 52 percent females.

Age. As noted earlier, in the past adults in the age range from 16 to 44 years have made up about 80 percent of the enrollments in adult education. In the year 2000 there will be 119, 969,000 adults in the age range from 15 to 44. This will decrease by about 240,000 (.002, two-tenths of a percent) to 119,728,000 in the year 2010. During this same decade, adults aged 45 through 64 will increase by over 29 percent from some 61 million in the year 2000 to over 78 million in 2010.

Race/Ethnicity. Of the 211,718,000 million adults of the year 2000, the U. S. Census Bureau estimates that Whites of non-Hispanic origins will make-up 74.1 percent of the adults, Blacks 11.3, Hispanics 10.1, Asian & Pacific Islanders 3.7, and American Indians, Eskimos, & Aleuts 0.6 percent of the population.

In 2010, while there will be an increase of 5.0 percent in the number of Whites of non-Hispanic origins, they will make-up only 70.5 percent of the adult population, a decrease of some 4 percent.

In contrast, the numbers of Hispanics (of all races) will increase by 35.2 percent and their share of the total adult population will increase from 10.1 to 12.4 percent, a gain of over 2 percent. The Black adult population will grow by 14.0 percent during the first decade of the new millennium but it will remain quite constant (11.4 to 11.7 percent) as a share of the total adult population of 2010. The number of American Indian, Eskimo and Aleuts will increase by 15.7 percent but they will continue to be about 6 to 7 tenths of one percent of the total adult population. The numbers of Asian and Pacific Islanders will increase by 38 percent and will change from about 4 to some 5 percent of the total adult population.

Immigration. From 1961 to 1970 there were over 3.3 million immigrants to the United States. Of these, 33.8 percent were from Europe, 12.9 percent from Asia, 51.7 percent from America (mostly Latin America, though 12.4 percent were from Canada), 0.9 percent were from Africa, and 0.8 percent were from Oceania (including Australia and

New Zealand).

Table 4. Immigration by geographical region from 1961 to 1990.
(In thousands for fiscal year ending in year shown)

Regions		1961-70	1971-80	1981-90a
Total*	Number	3,321.7	4,493.3	7,338.0
	Percent	100	100	100
Europe	Number	1,123.5	800.4	761.5
	Percent	33.8	17.8	10.4
Asia	Number	427.6	1,588.2	2,738.1
	Percent	12.9	35.2	37.3
America[b]	Number	1,716.4	1,982.5	3,615.6
	Percent	51.7	44.3	49.3
Africa	Number	29.0	80.8	176.8
	Percent	0.9	1.8	2.4
Oceania	Number	25.1	41.2	45.20
	Percent	0.8	0.9	0.6

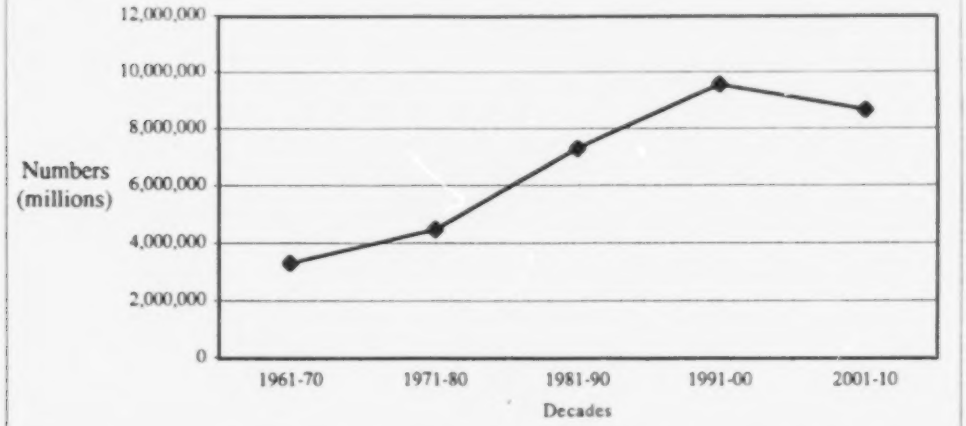
*Totals may not add to 100 due to rounding. [a]Includes 478,814 previously illegal aliens who were granted permanent resident status in 1989 under section 245A of the Immigration Reform and Control Act (IRCA) of 1986. [b] Includes Canada; the others are Caribbean & Latin American countries. Source: Famighetti, R. (Ed.) (1993). The World Almanac and Book of Facts: 1994. Mahwah, NJ: Funk & Wagnalls, p. 370.

By contrast, from 1981 to 1990 there were some 7.3 million immigrants to the United States. Of these, the proportion of Europeans dropped from 33.8 to 10.4 percent, while Asians increased from 12.9 to 37.3 percent. Immigrants from America dropped from 51.7 to 49.3 due primarily to drops in immigration from Canada and Cuba. During this sametime, immigration from Mexico increased 8.9 percent from 13.7 percent in 1961-70 to 22.6 in 1981-90. Africans increased from 0.7 percent in 1961-70 to 2.4 percent in 1981-90. It should be noted that during 1989, 478,814 previously illegal aliens were granted permanent residence status under the Immigration Reform and Control Act (IRCA) of 1986. So while the official immigration numbers increased, there were not actually that many new residents of the United States from other countries.

For the period 1994 through 1996, some 2,440,772 immigrants arrived in the United States. Of these, about 54 percent were females and 46 percent males. About one-fifth were under the age of 15 years, three-fifths were aged 15 to 44, and about one-fifth were 45 years old or older (Bureau of Immigration and Naturalization, 1996).

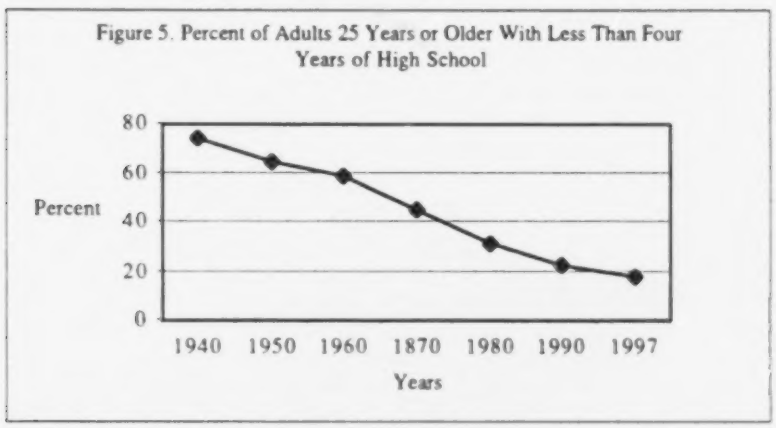
Figure 4 shows immigration numbers for five decades from 1961-70 through 2001-10. The data for the decade of 1991-00 include estimates of data for 1997- 2000 at 863,000 per year. This is the average for the years 1992-96. Similarly, the data for the decade 2001-10 are based on an estimated 863,000 immigrants per year. If past trends hold, then the immigrants of the first decade of the next century will be primarily females under the age of 45 with less than a high school education. Mexico will be the country with the largest numbers of immigrants, and three out of four of these immigrants will live in either California, Texas, or Illinois.

Figure 4. Immigration Into the United States
Data for 1991-00 and 2001-10 based on estimates.



Educational Attainment. Throughout its history, the federal adult education program has focussed on serving adults who do not have a high school diploma. For over half a century the percentage of these adults over the age of 25 years who have not completed four years of high school has decreased (Figure 5). However, by 1997 almost one in five (18%) adults, over 30,000,000, had not completed four years of high school. For Asian/Pacific Islanders, Whites, Blacks, and Hispanics, the percentages of adults who were non-high school graduates in 1997 were 15, 17, 25, and 45, respectively.

Figure 5. Percent of Adults 25 Years or Older With Less Than Four Years of High School



Adult education is generally divided into adult basic education (ABE) which is for adults with 0-8 years of education and adult secondary education (ASE) for adults with 9 to 11 years of education. The ASE program aims to help adults achieve the high school diploma or its equivalent.

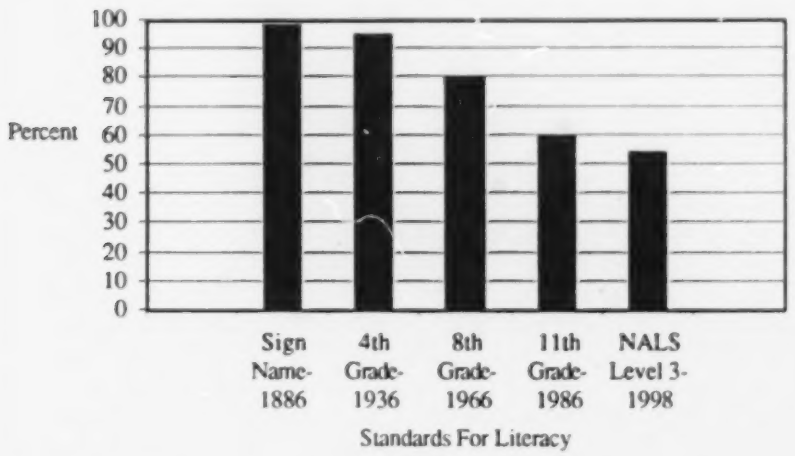
In March of 1996, there were some 200 million adults over the age of 16 years. Of these, somewhat less than 7.5 percent had fewer than 9 years of education, corresponding to those qualified for ABE, and some 14.5 percent had completed only 9-11 years of schooling corresponding to those qualifying for ASE. In the age range of 16 to 24, 38.8 percent of males and 35.3 percent of females had completed 9-11 years of education.

With the recent trend of serving troubled youth in adult education programs, many of the youngest adults may complete their high school education in adult education ASE programs.

Literacy Skills of Adults

Over the last 100 years the standards for what it means to be "literate" in the United States have changed.

Figure 6. Percent of Young Adults Meeting Different Standards of Literacy Over the Last 100 Years



The 1985 National Assessment of Educational Progress Young Adult Literacy Survey (YALS) revealed how many adults aged 21-25 years old scored above or below the standards of literacy of 100, 50, 25 and 12 years ago. The 1993 National Adult Literacy Survey (NALS) showed how many young adults 16-24 years scored below NALS Literacy Level 3, the standard set by the National Governor's Association for being considered "fully literate" in contemporary times. Figure 6 shows the percentage of young adults reaching these different standards.

General Trends for Last 75 Years. An extensive review of adult literacy assessments from 1917 to the present was recently accomplished (Sticht & Armstrong, 1994). This review revealed that over the last 75 years, various "intelligence," "aptitude," and "literacy" tests for adults have used similar items and similar procedures, regardless of what they were thought to be measuring. Given that all these standardized tests have assessed people's knowledge and thinking processes, it is not too surprising to find that a number of trends have remained salient across time.

One general finding from numerous assessments of adult cognitive abilities is that, with a broad range of abilities in the test populations, there are high correlations among performance on "intelligence", "aptitude" or "literacy" tests. In one study correlations between the military's verbal aptitude test scores and scores on any one of five different standardized tests of reading for adults were in the .8 to .9 range, about as high as they could get given the psychometric properties of the tests (Waters et. al., 1988, p. 46).

These high correlations indicate that, *on average*, using any one of the tests taken at random, highly literate persons will achieve in the upper range of scores, moderately literate persons will score in the mid-range, and less literate persons will score in the lower range of scores. The implication of this for adult literacy programs is that if a person's literacy level is genuinely increased from low to mid-level or high, this means that the person's scores on all sorts of standardized tests should also show an increase. Highly literate people score well on all sorts of standardized tests because they tend to have large bodies of knowledge and well-developed thinking skills.

Note that we are here speaking of average trends for groups. Individuals may show different results. For instance, learning disabled individuals may perform well on orally-administered tests of "intelligence," but poorly on literacy tests involving reading. In fact, the discrepancy between one's oral and written language knowledge and thinking skills is often used to determine whether one is or is not learning disabled. Similarly, marginalized members of society may, as a group, perform more poorly than mainstream, majority members of the society. But within these groups, many marginalized individuals may perform better than many mainstream individuals. These distinctions between group and individual data should be kept in mind in reading and interpreting the following statements of trends (also see Wiley, 1996, for socioeconomic, linguistic and cultural factors that influence standardized test scores in various groups).

Keeping the foregoing cautions in mind, the following group test score trends have been found over the last 75 years using any number of cognitive assessments. *On average*:

(1) Better educated adults score higher than less well educated adults.
(2) Younger adults perform better than older adults.
(3) Adults in western, eastern, and northern states perform better than those in southern states.
(4) Whites perform better than African-Americans or non-native language speakers.
(5) Adults in professional, managerial, technical and clerical occupations perform better than adults in laborer, operative, agricultural, and other relatively unskilled occupations.
(6) Higher income groups perform better than groups with lower incomes or on welfare.
(7) Incarcerated adults do not perform as well as non-incarcerated adults.
(8) Adults with better educated parents perform better than adults whose parents are less well educated.
(9) Higher educated adults engage in a greater amounts of reading of books, magazines, and newspapers.
(10) People are not literate or illiterate but are rather more or less literate and the problem for establishing literacy standards is to decide "how good is good enough."

Trends in Setting Standards For Adult Literacy. Item 10, above, is concerned with the problem of how to determine on a continuum a point or points that divide the continuum into various "amounts" of literacy. This is an issue that is being vigorously pursued in measurement and standards setting arenas today (Kolstad, et al., 1998). It is critical because it underlies the practice of determining how many adults are "at risk" for poorly developed literacy skills and might therefore benefit from some level of government support for adult education.

Figure 7. Adult Literacy Levels From Low (1) to High (5)

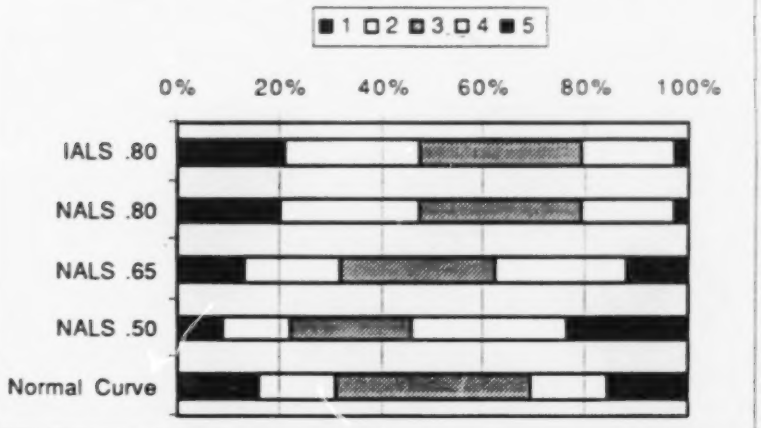


Figure 7 illustrates the different sorts of conclusions that one can reach depending upon how the standards for literacy are defined.

Both the International Adult Literacy Survey (IALS) and the National Adult Literacy Survey (NALS) set a criterion of having an 80 percent probability of getting the average item at a given Literacy Level correct to be assigned to that level of skill. This resulted in some 47 percent of adults in the United States being classified as below the National Governor's Association's standard of Level 3 for adult literacy.

However, Andrew Kolstad, the leader of the NALS project at the National Center for Education statistics has argued that the 80 percent probability level is arbitrary (Kolstad, 1996). He calculated the percentage of adults who would be below the Level 3 standard if a criterion of 65 percent, which is used by the National Assessment for Educational Progress (NAEP) for the K-12 system, was used. In this case the percentage of adults scoring below Level 3 dropped to 32, a reduction of some 15 percent.

Kolstad also determined the consequences of using the 50 percent probability criterion used by the widely employed Comprehensive Adult Student Assessment System (CASAS) which is included in the federal govenment's dissemination network. In this case, only 9 percent were in Level 1, the lowest level of literacy. Twenty percent of adults were found to be scoring below Level 3. This is a 27 percent reduction of adults considered "at risk" for literacy using the 80 percent criterion of the IALS or NALS for assigning adults to the various levels of literacy.

For comparison purposes, also given in Figure 7 are the percentages of adults that fall within the five levels in the areas under the normal curve defined by –1 standard deviation or below the mean, between –1 and –0.5 standard deviations below the mean, plus or minus .5 standard deviations around the mean of the distribtution, between +0.5 and +1 standard deviations, and +1 or higher standard deviations above the mean. Using this approach, there are about 30 percent of adults below level 3, which in this case is the large number of people in the middle of a typical "bell curve."

At the present time, stimulated by Kolstad's work, there is considerable debate going on at the National Center for Education Statistics about just which standards should be used

for all assessments, those for K-12 and adults as well (Kolstad, et al., 1998). This is a debate that is likely to persist into the new millennium. For the present, it seems safe to conclude that adults who are in the bottom quintile (lowest 20 percent) on the NALS are also likely to score low on similar types of cognitive tests ("intelligence," "aptitude"-see below) and may be considered "at risk" for unemployment, low income, poor health, incarceration, and dereliction of citizenship duties in our society. By the year 2010, if the educational system does not improve dramatically, there will be some 46 million adults in this "at risk" category of literacy skill.

Science Trends

Trends in neuroscience (brain science) and cognitive science have relevance for understanding the importance of adult education for sustaining cognitive functions across the lifespan and across generations. Some of these trends are discussed in the next two sections.

Brain Development in Children and Adults. One of the beliefs in our culture is that the brain and its intellectual capacity is developed in early childhood and this has important implications for cognitive development over the lifespan. Even the First Lady of the United States has weighed in with the pronouncement that , "The first three years of life are crucial in establishing the brain cell connections. ...By the end of three or four years, however, the pace of learning slows... The process continues to slow as we mature, and as we age our brain cells and synapses begin to whither away. ...With proper stimulation, brain synapses will form at a rapid pace, reaching adult levels by the age of two and far surpassing them in the next several years." (Clinton, 1996, pp. 57-58).

It is widely believed that if children's early childhood development is not properly stimulated, then there is likely to be underdevelopment of the brain and that can lead to lower intellectual ability, poor school learning and to a life characterized by social problems such as unemployment, criminal activity, teenage pregnancy and welfare. It will be difficult if not impossible to overcome the disadvantages of deficiencies in early childhood stimulation later in adulthood. And so, some might argue, "Why should we invest in adult literacy education? Let's put our money into early childhood programs. An ounce of prevention is worth a pound of cure!"

But now trends in both brain science and cognitive science have converged to bring about revisions to these ideas from the conventional wisdom. For over a decade, the James S. McDonnell Foundation in St. Louis has supported extensive research in neuroscience. Recently, John Bruer, President of the Foundation has written articles to explain the findings of brain science and their relevance, or lack thereof, for early childhood and in-school education (1997, 1998). Following is a brief summary from the 1998 article of what Bruer regards as major misconceptions that educators have of brain science.

(1). *Enriched early childhood environments causes synapses to multiply rapidly*. Bruer states, "What little direct evidence we have – all based on studies of monkeys - indicates these claims are inaccurate....The rate of synaptic formation and synaptic density seems to be impervious to quantity of stimulation. ...Early experience does not cause synapses to form rapidly. Early enriched environments will not put our children on synaptic fast tracks"(1998, pp. 13-14).

(2). *More synapses mean more brainpower*. Bruer states, "The neuroscientific evidence does not support this claim, either. ...Synaptic densities at birth and in early adulthood are approximately the same, yet by any measure adults are more intelligent, have more highly flexible behavior, and learn more rapidly than infants" (1998, pp. 14-15).

(3). *The plateau period of high synaptic density and high brain metabolism is the optimal period for learning*. Bruer states, "The neuroscientific evidence for this claim is extremely weak. The neuroscientists who count synapses in humans and monkeys merely point out that during the plateau period, monkeys and humans develop a variety of skills and behaviors. ...We do not know what relationship exists between high resting brain metabolism and learning, any more than we know what relation exists between high synaptic numbers and ability to learn....We can as readily make the opposite conjecture...that the presence of excess synaptic activity might have negative effects on children's brain function because the large numbers of unspecified synapses might interfere with efficient information processing in the cortex"(1998, pp. 15-17.

Bruer goes on to say that, "Truly new results in neuroscience, rarely mentioned in the brain and education literature, point to the brain's lifelong capacity to reshape itself in response to experience"(1998, p. 17). Confirming this point of view, the San Diego Union-Tribune of May 1, 1998 reported research on the brains of aged mice at the Salk Institute (Graham, 1998, p. B-1). This research showed that aged mice, equivalent to 65 year old humans, actually grew new brain cells. Furthermore, aged mice in an environment rich in visual and physical stimulation grew new cells, not just new synaptic connections among existing cells, at three times the rate of mice in relatively barren cages. Other research has now shown that new brain cells can grow in primate species.

Exactly what all this might mean for educational practices is not known. But apparently brain science does not presently offer any basis for reducing our educational activities with adults. Bruer says that, "For the present, educators should critically read and evaluate those articles on cognitive science and put brain science on the back burner" (1998, p. 17).

Cognitive Science and the Literacy Development of Adults. Over the last 75 years in the United States and many other industrialized nations schooling levels have risen and medical care and nutrition have improved. Along with these improvements in peoples lives have come increases in average scores on various mental abilities tests, including those referred to as intelligence or IQ tests (Neisser, 1997).

Additionally, because literacy, as the ability to efficiently read and write in one's oral language, uses the same knowledge base of grammar (vocabulary, syntax) and thinking processes as are used in intelligence and other ability tests, average literacy levels have increased along with the other mental abilities over the last 75 years. In 1917, during World War 1, when the first mass testing of adults began, illiteracy was so widespread that two forms of mental tests were made, one for literates and one for illiterates (and non-English speakers). Over a quarter of the examinees had to take the test for illiterates. Today, literacy is so widespread that the military routinely administers written aptitude tests to all applicants for service without even considering that literacy is intertwined with the other skills on the tests (Sticht & Armstrong, 1994).

Interestingly, literacy tests are also administered throughout the United States, in both K-12 schools and adult education programs without concern that all the other aspects of knowledge and cognitive processing that are engaged in tests labeled as intelligence, aptitude or achievement, tests like the GED, are all intertwined with the literacy aspect (mostly reading) of the literacy tests. In short, cognitive scientists now recognize that all tests of cognitive abilities tap largely the same underlying components of knowledge and information processing skills (Hunt, 1995; Gottfredson, 1997; Sternberg, 1998).

Psychometric research on intelligence over the last half century has resulted in a trend to draw a distinction between the knowledge aspect and the processing skills aspects of intelligence. Beginning in the 1940s and continuing up to the 1990s, Cattell and various collaborators, and later many independent investigators, made the distinction between "fluid intelligence" and "crystallized intelligence." Cattell (1983) states, "Fluid intelligence is involved in tests that have very little cultural content, whereas crystallized intelligence loads abilities that have obviously been acquired, such as verbal and numerical ability, mechanical aptitude, social skills, and so on. The age curve of these two abilities is quite different. They both increase up to the age of about 15 or 16, and slightly thereafter, to the early 20s perhaps. But thereafter fluid intelligence steadily declines whereas crystallized intelligence stays high" (p. 23).

Cognitive psychologists have re-framed the "fluid" and "crystallized" aspects of cognition into a model of a human cognitive system made-up of a long term memory which constitutes a knowledge base ("crystallized intelligence") for the person, a working memory which engages various processes ("fluid intelligence") that are going on at a given time using information picked-up from both the long term memory's knowledge base and a sensory system that picks-up information from the external world that the person is in. Today, over thirty years of research has validated the usefulness of this simple three-part model for thinking about human cognition (Healy & McNamara, 1996).

The model is important because it helps to develop a theory of literacy as information processing skills (reading as decoding printed to spoken language) and comprehension (using the knowledge base to create meaning) that can inform the development of new knowledge-based assessment tools and new approaches to adult education.

The International Adult Literacy Survey (IALS) and National Adult Literacy Survey (NALS) both used "real world" tasks that are complex information processing tasks that engage unknown mixtures of knowledge and processes. For this reason it is not clear what they assess or what their instructional implications are (Venezky, 1992).

A recent analysis of the NALS used the simple model of the human cognitive system given above to analyze performance on the NALS (Sticht, Hofstetter, & Hofstetter, 1996). It was concluded that the NALS places large demands on working memory processes ("fluid intelligence") and that is what may account for some of the large declines in performance by older adults. To test this hypothesis, an assessment of knowledge ("crystallized intelligence") was developed and used to assess adult's cultural

knowledge of vocabulary, authors, magazines and famous people. The knowledge test was administered by telephone and each item was separate and required only a "yes" or "no" answer, keeping the load on working memory ("fluid intelligence") very low.

Figure 8. Scores on the National Adult Literacy Survey (NALS) Prose Scale and the Telephone Knowledge Scale

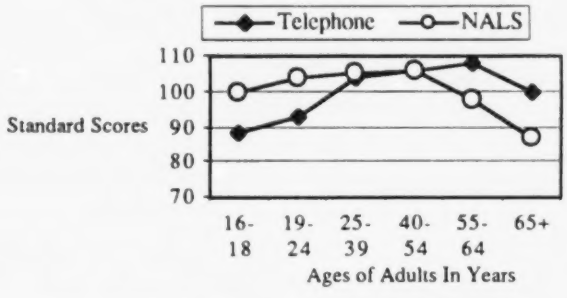


Figure 8 shows the results with both sets of test scores transformed to standard scores with a mean of 100 and a standard deviation of 15. Clearly, younger adults do better on the NALS with its heavy emphasis on working memory processes ("fluid intelligence") and older adults do better than younger adults on the knowledge base ("crystallized intelligence") assessment that was given by telephone.

In addition to a trend to incorporate bodies of content knowledge more prominently in theories and assessments of adult cognitive development (Ackerman, 1996), there is a growing recognition of the importance of focussing on the bodies of content knowledge that are taught in adult basic education in addition to the concern with developing generic, content-free "skills" like "reading" with little concern for the substance of what is being read and how to develop interrelations among bodies of knowledge (see articles on content-based adult literacy education in the December 1997 issue of *Focus on Basics* from the National Center for the Study of Adult Learning and Literacy).

The Social Basis of Cognition and the Intergenerational Transfer of Literacy from Parents to Their Children. The focus on knowledge in adult literacy education is also particularly relevant for the intergenerational transfer of cognitive skills from parents to their children.

Figure 9. Adults' Literacy Levels as a Function of Their Parent's Education Levels (No High School, etc.)

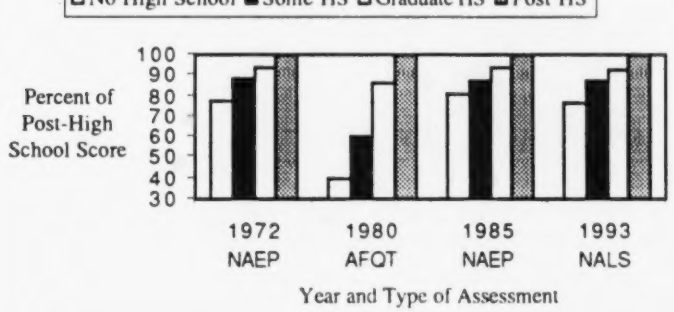


Figure 9 shows data for four national assessments of the literacy skills of adults as a function of the adults' parents' education (Sticht & Armstrong, 1994). Clearly there is an intergenerational transfer of literacy from parents to their children and this transfer persists into adulthood. Similar

findings have been found in other nations in the recently completed International Adult Literacy Survey (IALS).

Much of this transfer occurs in early childhood and includes the transfer of concepts from parents, siblings and others in social exchanges with children through oral language. Over a quarter century ago it was demonstrated that reading skills build upon earlier developed oral language skills (Sticht, et al., 1974). Recently Hirsch (1996) has noted, "Sticht's Law holds that for nondeaf persons, the comprehension of written language cannot exceed the comprehension of oral language, that oral speech is the foundation of written speech. If children's oral-aural vocabulary and their oral-aural comprehension abilities are not well developed, neither will their reading abilities be. But if children's oral-aural communication abilities *are* well developed, the only barrier to their becoming good readers is lack of fluency and accuracy in their decoding skills. " More recent research has confirmed this simple model of reading as decoding plus comprehension of oral language (Chen & Vellutino, 1997).

Hart & Risley (1995) present extensive data showing that parents from professional backgrounds address some 11 million words a year to a preschool child, almost twice as much as the 6 million words addressed by working-class parents to their children, and four times the 3 million words addressed to their children by parents on welfare. Later on, after learning decoding skills of reading, children from the homes of professionals comprehend what they read at higher levels than do children from working-class or welfare homes.

The importance of children's parent's language and literacy skills in providing preschool children with well developed oral-aural and other literacy-related knowledge was reiterated in the recent National Academy of Sciences report, *"Preventing Reading Difficulties in Young Children"* (Snow, Burns, & Griffin, 1998). It states:

> "Children who are particularly likely to have difficulty with learning to read in the primary grades are those who begin school with less prior knowledge and skill in relevant domains, most notably, general verbal abilities, the ability to attend to the sounds of language as distinct from its meaning, familiarity with the basic purposes and mechanisms of reading, and letter knowledge. Children from poor neighborhoods, children with limited proficiency in English, children with hearing impairments, children with preschool language impairments, and children whose parents had difficulty learning to read are particularly at risk of arriving at school with weaknesses in these areas and hence of falling behind from the outset."

Clearly the National Academy of Sciences report places direct responsibility upon youth and adults, both parents and parents-to-be, to provide proper preschool care and stimulation that produces children with the oral language skills and experience with literate environments that will prepare them to enter the culture of the school ready to learn. The growing recognition of the social basis of cognition and the role of undereducated youth and adults as their children's "first teachers" is a trend supported by cognitive science that has influenced federal and state government policies. It will likely persist and become of even more importance in the first decade of the new century.

Economic Trends

Adult education is about helping adults develop new knowledge and skills. For this reason, this section looks at trends of an economic nature that have had and are likely to continue to have some effects on the adult education delivery system because they have effects on both an adult's personal needs for knowledge and skills, and societies' needs for better educated adults who can take care of themselves and their families with greater responsibility.

One overarching trend in economics that may affect adult education is the group of factors that have converged to cause personal *competence* (including literacy, as well as other factors including emotional maturity, interpersonal ability, etc.), not just educational credentials, to play an independent role in determining an individual's personal workforce competitiveness in the globalization of capitalism (OECD,1997, pp. 39-60).

Globalization of the Workforce. Because of improvements in information technologies, telecommunications, transportation, the reconstruction of Europe and Japan after World War II, and several decades of economic aid to developing nations, adults in the United States now find that though they must live locally, they are competing for work not just in a local or national workforce, but in a global workforce.

According to a new Hudson Institute report by Judy & D'Amico (1997), globalization of the workforce has meant that lower skilled, but well-paying jobs in the U.S. have, over the last decade, been shipped out of the country to be performed by low-skilled, cheaper labor. For instance, jobs in the textile industry dropped by over a third from one million in 1969 to 635,000 in 1996. However, globalization has also brought jobs to the U.S. In 1969, only some 4 percent of all U.S. manufacturing workers worked in export-related jobs, but by 1981 that percentage had grown to 12.8 percent, and by 1991 to 18.6 percent. If this trend persists, then this percentage of export-related manufacturing jobs will increase to 25 percent by 2000 and up to 50 percent by 2010.

So while globalization of the workforce has both an upside and a downside overall, for low-skilled workers the prospects are grim. That is because their wages in earlier times were not influenced by competition from low-skilled workers who work for so little wages and live a much lower standard of living.

High Employment Rates. As low-skilled workers find themselves in competition with workers in developing nations they find that the high supply of low-skilled workers in the world reduces the demand for low-skilled workers in the U.S. and that drives down the wages of lower skilled workers in the U.S. So even when the unemployment rate in the U.S. has fallen to historic lows, as it has in the last half of the last decade of the 20th century, workers find that these millions of new jobs being created are primarily low paying or if they pay well they demand higher levels of knowledge and skills than earlier, well-paying but low-skilled jobs.

As noted above (Figure 3), enrollments in adult education have not been much influenced by employment rates in the past. So the present high rates of employment are not likely to affect enrollments at the national level. However, in specific localities, there may be pockets of adults with very low skills and local labor markets may be facing worker shortages, so there may be greater opportunities for adult education to upgrade skills of unemployed and employed workers so that they can obtain higher wages.

Skills Demands of Work

In their book on *Workforce 2020* Judy & D'Amico (1997) bring up to date the discussion about the national perspective on the skills demands of jobs that was given in the earlier Hudson Institute report called *Workforce 2000* . That report suggested that there would be a "skills gap" between the qualifications of workers and the changing job mix of the American economy by the year 2000.

Table 5. Definitions of Department of Labor General Education Development (GED) Skill Levels

Language Skill Levels

1. Recognize meaning of 2,500 (two-or three –syllable) words. Read at rate of 95 –120 words per minute. Compare similarities and differences between words and between series of numbers. Print simple sentences containing subject, verb, and object, and series of numbers, names, and addresses. Speak simple sentences using normal word order, and present and past tenses. [3rd grade]
2. Passive vocabulary of 5,000-6,000 words. Read at rate of 190-215 words per minute. Read adventure stories and comic books, looking up unfamiliar words in dictionary for meaning, spelling, and pronunciation. Read instructions for assembling model cars and airplanes. Write compound and complex sentences, using cursive style, proper end punctuation, ad employing adjectives and adverbs. Speak clearly and distinctly with appropriate pauses and emphasis, correct pronunciation, variations in word order, using present, perfect, and future tenses. [6th grade]

Mathematics Skill Levels

1. Add and subtract two digit numbers. Multiply and divide 10's and 100's by 2, 3, 4, 5. Perform the four basic arithmetic operations with coins as part of a dollar. Perform operations with units such as cup, pint, and quart; inch, foot, and yard; and ounce and pound. [3rd grade]
2. Add, subtract, multiply and divide all units of measure. Perform the four operations with like common and decimal fractions. Compute ratio, rate, and percent. Draw and interpret bar graphs. Perform arithmetic operations involving all American monetary units. [6th grade]

However, the fact that unemployment is now at record lows (less than 5 percent) suggests that most of those in the labor market who are looking for work have found some sort of job that they can perform with their existing skills. In fact, using Department of Labor methods for estimating the Language and Mathematics requirements of jobs, *Workforce 2020* has uncovered what might be called a potential "basic skills surplus". Looking at 422 occupations the authors determined the General Education Development (GED) requirements in Language, Mathematics and Reasoning for the jobs being lost during 1994 to 2005 and the jobs being gained during that period. Setting aside their findings for Reasoning, which is a very vague concept in functional job analysis, Judy & D'Amico found that 75 percent of jobs that are declining in numbers require Language skills at Levels 1 or 2, while in jobs in growing occupations only 60 percent require

levels 1 and 2 Language skills. For Mathematics, declining jobs had 97 percent of requirements at GED levels 1 and 2, while only 65 percent of new jobs required levels 1 and 2 skills.

Even though the growing occupations have fewer jobs for adults with lower basic skills, the majority (65 to 75 percent) of jobs still have only low to moderate demands for reading and mathematics (see Table 5). Department of Labor studies (Phillip, 1970) have estimated GED level 1 as roughly equivalent to reading and mathematics as learned by the 3rd grade in school and level 2 by the 6th grade of elementary school.

Murnane & Levy (1996) identified the "new basic skills," the minimum skills people now need to get a middle-class job as:

- The ability to read at the ninth-grade level or higher.
- The ability to do math at the ninth grade level or higher.
- The ability to solve semi-structured problems where hypotheses must be formed and tested.
- The ability to work in groups with persons of various backgrounds.
- The ability to communicate effectively, both orally and in writing.
- The ability to use personal computers to carry out simple tasks like word processing.

While no national data have been found measuring the reading and mathematics grade level skills of a nationally representative sample of adults in the United States so we could say how many read and compute at the 9th grade level, the data of Figure 6, above, indicate that on the Young Adult Literacy Survey (YALS) in 1985, 80 percent of young adults aged 16-24 years scored above the average score of 8th grade students and 60 percent scored above the average scores of 11th grade students. Fewer than 5 percent scored below the average score of 4th graders.

If the new Hudson Institute report is correct, 65-75 percent of the new jobs in the fastest growing occupations will require language and mathematics skills at or below the 8th grade level in school. So how many adults have such skills? While we do not have any data for mathematics, the YALS report indicated that as far as reading is concerned, the reading skills of 80 percent of young adults in 1985 surpassed the skills of the average 8th grade student. Indeed, 60 percent of young adults performed better than the average 11th grader. If the same findings held for mathematics, and the schools continue to graduate students into adulthood with the same levels of skills as the 1985 young adults, then as we enter the next century we may well be in the position as a nation of having a "literacy surplus" in which the overall skills of the workforce exceed the overall demands of workplaces.

Regarding the so-called "skills gap," then, what can be said for certain is that the last decade and a half has witnessed a plethora of analyses to find out if such a gap exists and to this date there has been no definitive answer (there is not even agreement on what is

meant by the word "skills," see papers for the National Academy of Sciences edited by Lesgold, Feuer, & Black, 1997). This debate is likely to persist into the next millennium.

What is not debatable is the 75 year old trends showing that on the average better educated people become better skilled in literacy and numeracy, they attend more post-secondary education, they get more diplomas and degrees, they get better jobs that pay more and they engage in more continuing education throughout their lifetimes.

The effects of increased education and competence in literacy-related activities is important in increasing the employability and incomes of adults across gender, race, and ethnicity. However, Raudenbush & Kasim (1998) suggest that while differences in education and literacy explain some of the differences between employment rates and income between majority and minority groups, and men and women, education and literacy skills do not account for all the differences in these economic indicators. Their suggestion is that there is still discrimination and bias that contributes to inequalities across groups of workers in the United States.

Despite any caveats suggested by the foregoing, for individuals, whether men or women, regardless of race or ethnic group, investing their money, time and energy in developing their intellectual skills to the highest levels that they can, using the public and private education systems at elementary, secondary and post-secondary levels, reading widely and staying informed, is action that is under their control and that provides a greater likelihood of becoming self-sufficient, comfortable and economically secure in the expanding world of capitalist nations (OECD, 1997).

Age, Health and Economics. For the most part, human capital theory applied to adult education has focussed on the returns to education in increased employment, productivity and income. Generally, investments in human capital by governments and businesses provide increased returns in taxes and profits (OECD, 1997).

A more recent trend has seen the extension of human capital theory to the problems that are emerging resulting from the overall aging of the population and the growing costs of medical care. Recent research suggests that better educated adults enjoy better health. Education increases physical functioning and subjective health among adults of all ages and decreases age-specific rates of morbidity, disability and mortality (Mirowsky & Ross, 1998).

The overall general trend in health-related research on aging, education and human capital theory suggests that while education achieves a large part of its human capital returns from increasing people's knowledge and skills for finding and keeping well-paying work, education plus a satisfactory work life helps people develop motivation, confidence, and personal competence in the ability to solve problems, improve social relations with others, and enhances the belief that one can control one's life. This, in turn, encourages a healthy lifestyle and reduces medical costs for adults and, importantly, it improves the health care of the adult's children leading to reduced medical costs for children, too.

As the population continues to age and health care becomes of greater concern for both our young and aging populations, adult education may be positioned to provide educational opportunities that can provide human capital investment returns not only for workforce development but also for health and medical costs.

Research Note.: Assessing Literacy-Based Knowledge by Telephone

A 1996 study used the ideas presented above that the same knowledge base underlies most cognitive processes, including both listening and reading, to assess the knowledge component of literacy by telephone. The study showed that by assessing adults' knowledge by telephone one could obtain all the information products that the U. S. Congress wanted from the National Adult Literacy Survey (NALS) for about one-sixth the cost. The following shows how the telephone survey was used to study what it is that makes highly literate people highly literate.

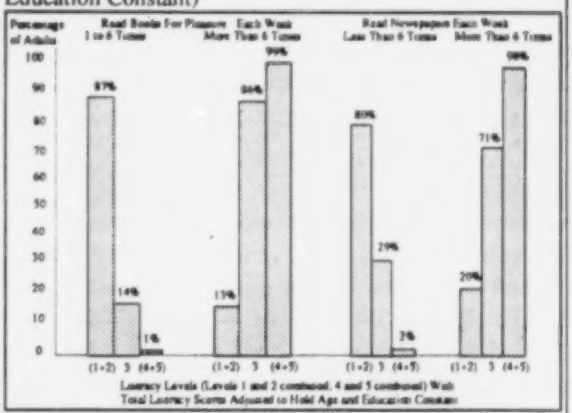
Generally speaking, highly literate individuals possess large bodies of knowledge and efficient processes for decoding written language. But how do the highly literate obtain these vast bodies of knowledge and efficient information processing skills, such as those used in the automatic recognition of written words?

The results of the telephone survey and several other lines of research (and, perhaps, common sense!) converged to suggest that people become highly literate largely by engaging in numerous literacy practices, such as reading books, magazines, newspapers, and so forth. A review of the major assessments of adult literacy in the United States revealed that, since 1937 it has repeatedly been found that for adults, as years of education increases there are corresponding increases in both the number of literacy practices in which adults engage and the amount of skill displayed in the assessments.

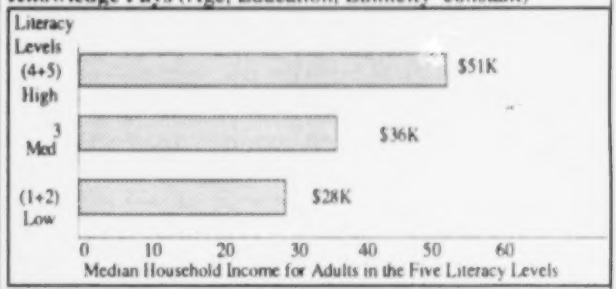
Research indicates that those who read a lot acquire a large knowledge base containing the names of authors, magazines, newspapers, persons known for their contributions to film, theatre, music and other cultural activities, and a large vocabulary of words that are typically not encountered with high frequency in day-to-day oral communication nor on television or radio. People's knowledge of this sort indicates both the amount of reading in which they engage and the literacy levels they achieve through growth in their declarative knowledge bases.

In agreement with the NALS and recent International Adult Literacy Survey (IALS), the telephone study of adult literacy found that more knowledgeable people read more, they get more education, better jobs and tend to earn more. The latter held even when scores were adjusted for age, education and ethnicity.

Knowledgeable Adults Read More (Age & Education Constant)



Knowledge Pays (Age, Education, Ethnicity constant)



Literacy levels defined in Sticht, Hofstetter & Hofstetter (1996). Assessing adult literacy by telephone. *J. of Literacy Research.*

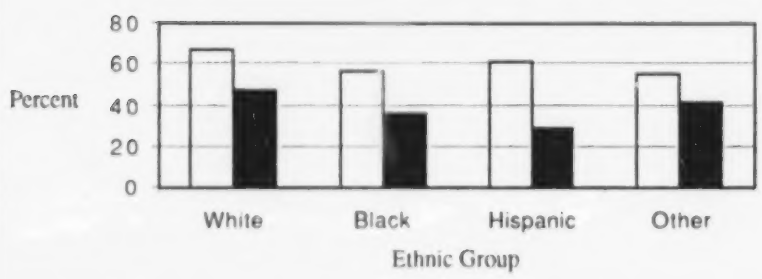
Technology Trends

There are several technologies that have and will continue to affect adult education. They range from the ubiquitous telephone to the World Wide Web. Almost daily, there appears to be some new development in telecommunications and information technologies that can affect the way adult education is accomplished.

Telephones. Over 95 percent of households in the United States have telephones. For this reason, telephone technology has changed to permit a wider range of activities by clients. Adults can now receive a wide variety of information directly by telephone. Numerous businesses use telephones that offer menus that permit users to make choices among various types of information. Telephones now permit students to register for courses. Counseling services are provided regarding what kinds of education and training are needed for working in different kinds of occupations. Government agencies, businesses and other types of organizations are using telephones to conduct surveys. Telephones have been used to conduct knowledge and cognitive skill assessments. The telephone permits local adult education programs to conduct needs assessments inexpensively. This takes on added significance given the requirements for accountability under the Government Performance and Results Act (GPRA) of 1993.

Television. Some 97 percent of U. S. homes have television sets and some 90 percent have Video Cassette Recorders (VCRs). A 1992 review of the possibilities of extending television's use in adult literacy education made the case that with expanding numbers of channels, cable and satellite broadcasting, compression of video to permit greater numbers of signals, and increased interactivity it is time to greatly expand the use of television in adult education (Schwartz, 1992). This report was instrumental in forming the Adult Literacy Media Alliance (ALMA), a national multimedia adult learning service that is stimulating the greater use of television and coordinated print materials and the internet for the delivery of adult education as distance education and learning.

Figure 11. Use of Computers at Home and Work by Adults 18 Years and Older-1993



Computers. From 1984-85 to 1996-97, the number of computers in the public schools increased from 631,983 to 6,854,026 and the percent of schools with internet access jumped from 35 in 1994 to over 65 percent in 1996.

As of 1993 computer use among adults at home was over 50 percent across ethnic groups (Figure 11) and over a third were using computers at work. However adults with less education were much less likely to use computers at home or at work (Figure 12).

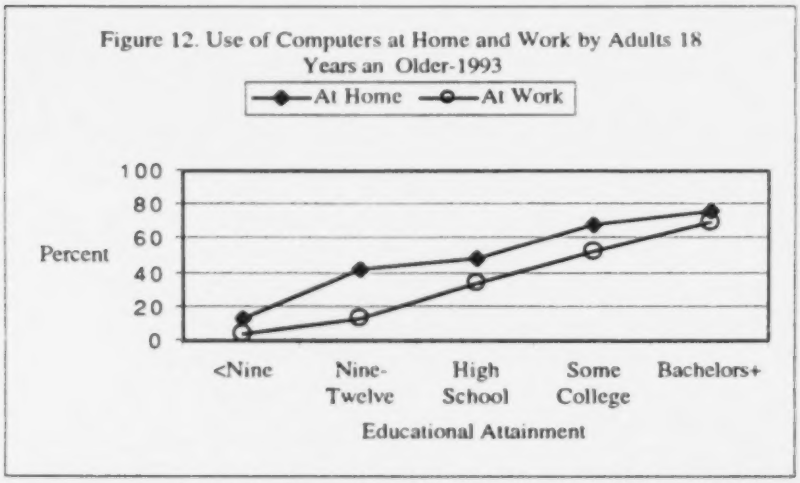


Figure 12. Use of Computers at Home and Work by Adults 18 Years an Older-1993

All this means that although more and more of those adults who enter adult education programs after having gone through the K-12 public school system will likely have had some experience with computers, those who have completed the least education are likely to have expectations that adult education will develop their computer and internet literacy beyond what they learned in the K-12 system, at home or at work.

Today's computers are faster, easier to use and less expensive than in 1993 when the foregoing data were reported and these trends are likely to continue into the new century. Expanded capacities for multimedia presentations will increase the attractiveness of computers for the delivery of instruction. Software packages that facilitate the collection, analysis, graphical display and reporting of program data will be more widely available for managing the data bases needed for increased accountability.

Internet and World Wide Web. The Internet with its associated World Wide Web pages is the explosive growth phenomenon in telecommunications and information technologies at the present time. For the last 15 years there has been logarithmic increase in the number of Internet hosts with web pages. It has been projected that by the year 2002 there will be over 150 million sites. This will produce unprecedented textual and graphics materials for teaching all sorts of knowledge and skills in language and other representational systems.

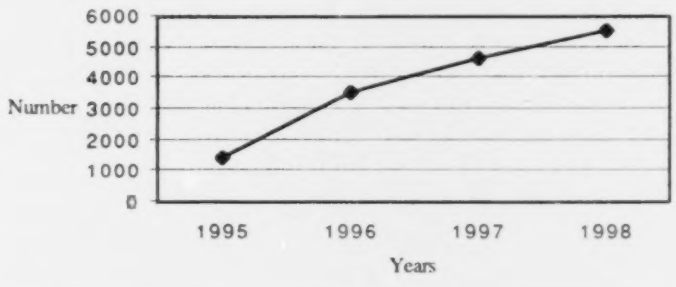
Because of the vast amount of information that is and will become available on the WWW, numerous special purpose, "intelligent," interfaces ("browsers") will be developed and many of these will have the express purpose of acting as facilitators of learning.

Distance Learning. The new developments in cable, satellite, and video cassette television, coupled with the use of telephones, fax machines, the Internet and World Wide Web, cheaper printers, scanners, digital photography and speech synthesizing technology has brought a renaissance into what used to be called "correspondence

courses." The new technologies have led to the widespread development of distance education and learning in which students and teachers are separated over time and space yet they are capable of almost continuous interactive communication.

Adult educators are taking to the new technologies by the thousands. For *staff development*, adult educators are using e-mail Internet services to form special interest groups that permit them to learn from one another and from visitors to their interest groups. For instance figure 13 shows how the number of messages posted to the ten listservs of the National Institute for Literacy have increased since 1995 when the first listservs were opened (the data for 1998 are based on the average postings for the first seven months multiplied by 12). These listservs permit practitioners, adult students, researchers, and policy makers to interact on matters related to policy, assessment, instruction and so forth.

Figure 13. Number of Messages Posted to Internet Forums of the National Institute for Literacy (data for 1998 estimated)



Distance education has grown with the expansion of the Internet and other technologies. In California, for instance, the California Virtual University offers more than 1600 courses via distance learning. Across the nation, the Community College Distance Learning Network is expected to offer 500 courses by the end of 1998.

Adult literacy education is also expanding its role in distance education. While Kentucky Educational Television has for over two decades made possible GED courses via television, new collaborations such as the Adult Literacy Media Alliance (ALMA) mentioned earlier, and PBS LiteracyLink, part of the U. S. Department of Education's Education Star Schools program, are just a couple of the many new groups moving ahead with adult basic education via distance learning. New courseware, such as *Crossroads Café* that teaches ESL via video, has been developed and many new educational products for assessment and instruction are coming available via the Internet and World Wide Web.

Part 3. Government and Legislative Trends

Over the last decade and a half the federal government has faced the daunting problem of reducing a multi-trillion dollar deficit. This has led to an overarching concern with reducing costs of federal programs. Emerging from this overarching concern are interlocking trends to reduce the federal role in the design and regulation of many programs by devolving responsibility for many programs to the states while maintaining a federal governmental oversight through new programs of standards and accountability.

Devolution Policies. In his book entitled *Disunited States*, Donahue (1997) examines the concept of devolution and notes that a general tendency from such policies is to place the states in competition with each other as they attempt to bolster their own economies. This can lead to strategies such as tax relief for business and industry to attract more and better paying jobs. This can lead to reductions in tax funds for needed services. Donahue states, "The gravest potential consequence of the trend toward competitive state autonomy may be a diminution (or a distortion) of public spending on education and training" (p. 144).

For instance, federal funding usually focuses upon disadvantaged adults while states may decide to serve a broader population. The displacement of low skilled, difficult to educate, train and employ adults and their families to other states through the implementation of laws hostile to their survival in the host state is another strategy that states can use in their competition for economic growth. This may be one reason that in many states welfare-to-work programs have been restructured to encourage "work first," "quick employment" strategies over longer-term, "education and training first" strategies for helping adults and their families find and retain employment and progress to higher level positions over time that will help them actually escape poverty (Strawn, 1998).

In general, the federal devolution to the states policies reflect the desire to reduce the costs of the federal government as a means of reducing the deficit. According to Donahue, this suggests that, "The metric for judging governmental strategies then becomes whether they promise to shore up, or to further erode, the economic foundations of our culture" (p. 6).

This perspective helps to explain the prevalence of work-oriented policies in such federal initiatives as "school-to-work," "welfare-to-work," and "workforce investment." These programs have as their goal the shoring-up of our nation's economic foundations by improving the productivity of the workforce. Implementation of these types of programs is guided by the devolution policy and is accomplished by the reduction of numerous separate federally driven programs and the provision of "block grants" to the states with fewer guidelines and regulations from the federal government. The new Workforce Investment Act of 1998 continues this partnership of federal, state and local agencies engaged in activities to shore up ... the economic foundations of our culture" through workforce development activities.

Standards and Accountability. Most recently, with federal budgets aligned to reduce the deficit to zero in the first decade of the new century and an economy that is producing record profits, low rates of unemployment, and somewhat better wages, with a low rate of inflation, federal adult education funding has risen. However, like other programs that have been largely devolved to the states, the Workforce Investment Act of 1998 does not pass funds off to the states with no strings attached. Instead, like other programs subject to "block grants," adult education has become part and parcel of the new federal trend to encourage the setting of national education goals and standards and holding programs accountable for demonstrating achievements.

Goals 2000, the Educate America Act provided an overarching set of goals that serve to guide the development of standards for educational activities in the U. S. ranging from K-12 to adult literacy education. In the United States, as in most industrialized nations, adult literacy education is a marginalized, under funded and poorly appreciated component of national education activities. However, a careful examination of the national education goals suggests the need for a more centralized role for adult literacy education in national education reform activities. The following shows how adult literacy education is related to the eight national education goals of the Goals 2000 legislation in the United States.

Goal 6 of the National Education Goals listed in the GOALS 2000 legislation is called "Adult Literacy and Lifelong Learning." It states that every American will be literate and will possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship. While Goal 6 is the only goal that focuses directly upon adults, most of the other seven goals also rest largely upon success in achieving Goal 6 if they are to be achieved.

Goal 1, "School Readiness", calls for all children in America to start school ready to learn. This places direct responsibility upon youth and adults, both parents and parents-to-be to provide proper planning for the conception of children, the prenatal care of babies, and the post-natal, preschool care and stimulation that produces children with the oral language skills and experience with literate environments that will prepare them to enter the culture of the school ready to learn. Undereducated youth and adults whose literacy skills are low will likely find it difficult to contribute to the achievement of Goal 1 unless they achieve Goal 6 - literacy.

Goal 2 calls for the high school graduation rate to increase to a least 90 percent, while Goals 3 and 5 call for greater achievement in learning by students across the grades, with an emphasis upon science and mathematics. Goal 8 calls for greater parental participation in promoting the social, emotional, and academic growth of children.

All these goals presuppose, in the general case, the literate youth and adults called for in Goal 6. The Congress has recognized this relationship between adult literacy education and children's school readiness by including family literacy programs in the Workforce Investment Act of 1998, and by indicating that Title II of the Act may also be called "The Adult Education and Family Literacy Act."

Accountability in the Workforce Investment Act of 1998. The recognition that the education of youth and adults is not an incidental, marginal educational activity, but rather a key factor in accomplishing the remaining education goals offers a challenge for adult literacy education in the new millennium. It places great responsibility upon policymakers to increase their attention and resources to create a system of adult literacy education that is not a marginalized, piecemeal collection of services but is rather an integral component of the educational commitment of the nation (Barton, 1998; Sticht, 1998; The Commission on the Skills of the American Workforce, 1990). It places further

responsibility upon adult literacy educators to develop effective programs that produce demonstrable, sustainable, useful gains in literacy.

The need for better standards and indicators for accountability in federal programs was codified in the Government Performance and Results Act (GPRA) of 1993. In September of 1995, a General Accounting Office report entitled *Adult Education: Measuring Program Results Has Been Challenging (GAO/HEHS-95-153)* was released. The GAO study of the federally and state-sponsored adult literacy education system indicated that progress in achieving GPRA in the federal adult education program had been stymied because "...program objectives have not been clearly defined and questions exist about the validity and appropriateness of student assessments and the usefulness of nationally reported data on results "(p.23).

In June of 1997, the GAO produced another report entitled *The Government Performance and Results Act: 1997 Government wide Implementation Will be Uneven (GAO/GGD-97-109.* This report found mixed results in performance accountability across government agencies and observed that among the significant challenges many agencies face are those that "...involve methodological difficulties in identifying performance measures or the lack of data needed to establish goals and assess performance." (p. 6).

To facilitate the accountability of the federal adult education program, Congress passed the new Workforce Investment Act of 1998 with Title II, The Adult Education and Family Literacy Act. Title II calls for states to develop five year plans that include, among other things, the performance measures described in section 212 of the Adult Education and Family Literacy Act. Section 212 requires "core indicators" of performance that include:

- Demonstrated improvements in literacy skill levels in reading, writing and speaking the English language, numeracy, problem-solving, English language acquisition, and other literacy skills.

- Placement in, retention in, or completion of, post-secondary education, training, unsubsidized employment or career advancement.

- Receipt of a High School diploma or its recognized equivalent.

The Adult Education and Family Literacy Act also requires that levels of performance for each indicator be established, and that the levels "...be expressed in an objective, quantifiable, and measurable form; and ... show the progress of the eligible agency toward continuously improving in performance." This state and local information is to be used by the U. S. Department of Education (USDOE), Office of Adult and Vocational Education (OVAE), Division of Adult Education and Literacy (DAEL) to report its progress in meeting the accountability standards of the Government Performance and Results Act of 1993.

This trend to continue to seek more effective methods for accountability in government programs, including adult education will likely be a hallmark of federal activities well into the first decade of the 2000s.

Part 4. High Priority Planning Issues

As we approach the new millennium the federal adult education program is poised to position itself as a mainstream education system to help individuals and communities participate more fully in the lifelong learning of new knowledge and skills for competing in the new global system of transportation, information and telecommunications. This opportunity for meeting adult education needs raises several high priority planning issues.

Moving from a marginal to a mainstream status. Presently the image of the adult education system is of a "second chance" system for adults who failed to complete their secondary education, or for immigrants who are seeking a new beginning in the United States. Too often it is considered as a "remedial" system and not a "prevention" system that can prevent children's failures in school, poor health and poor citizenship. Changing both the image and the delivery system for adult education should be a high priority undertaking for the federal government (Barton, 1998; Sticht, 1998; The Commission on the Skills of the American Workforce, 1990). This will involve efforts to:

1. Define the aims and objectives of adult education and lifelong learning in terms that are understandable to the public and policy makers. This will involve changing widespread ideas about human intellectual development, such as discussed above under Brain and Cognitive science.

2. Identify the segment(s) of the adult population to be served. The adult education system serves at one time as a bridge from basic education to a high school diploma or equivalency and at other times as a college preparatory program for many adults seeking entrance into higher education. It serves non-formal education, workplace education, family literacy education, etc. There needs to be planning efforts to provide a framework for capturing all the disparate populations and venues for adult education that defines how the adult education system fits into the system of elementary, secondary, post-secondary, higher education, and workplace training and education (Jurmo, 1998). It should also distinguish the federal adult education system from adult learning that takes place in the normal course of life through adult's interests in reading, surfing the Internet, etc. This may entail the development of various types of certifications or qualifications for recognizing participation in more formalized educational practices (Barton, 1998; The Commission on the Skills of the American Workforce, 1990).

3. Improve the quality of adult education programs. Study after study generally criticize adult education programs as being weak, poorly designed and executed, characterized by poor attendance, high drop out rates, and little if any improvements in learning. Efforts underway to improve the quality of adult education programs through better staff development, new technology-based curriculum materials, new methods of assessment of knowledge and skills, and the routine collection of data on indicators of program

achievements need to continue in an expanded mode. Much of this effort requires research and development that is the proper province of the federal program.

The U. S. Department of Defense and the Army, Navy and Air Force maintain human resources research institutes, centers and laboratories that spend more than $100 million a year to improve their personnel recruitment, assessment, placement, training, performance and education policies and practices. Yet for the rest of the nation, R & D for adult education is practically non-existent. Out of more than two dozen federally funded laboratories and centers for education, most focus on the K-12 system for children or higher education. One focuses upon vocational education and another on learning disabilities, and both of these centers include K-12 and some out-of-school youth and adults in their activities. But only one center is concerned exclusively with adult education, learning and literacy *per se*.

America's defense system is recognized as the best in the world, yet it does not rest on its laurels. It continuously invests precious R & D monies in adult human resources research and development. Given the central position of adult education in achieving national citizenship, economic, education goals, as outlined above, there is clearly a need for a greatly expanded and improved R & D effort in adult education.

New Data Resources and Analytical Techniques for Planning and Program Analysis

The amount of data now available that could be of potential value in planning and program analysis for adult education is voluminous. The Internet and World Wide Web now include a plethora of data bases useful in program planning and analysis.

Internet accessible quantitative data bases are extensive and include U. S. Census, Labor, Health, Education, Poverty and many other data bases from numerous government organizations. There are also extensive data bases of reports, newsletters, technical references, and so forth available. When coupled with new software packages such as the Excel software from Microsoft that was used in creating the figures in the present report a lot of data can be presented more comprehensibly in graphical formats than in tabular formats. If needed, the software permits numerous analytical techniques to be applied efficiently and by relatively untrained analysts. This includes techniques such as trend analysis, and various statistical analysis procedures.

World Wide Web sites and Listserv forums accessible via the Internet present a large amount of qualitative data that can be useful in program planning and analysis. Monitoring of a wide selection of these sites and forums can reveal emergent trends and questions of concern within the policy, practice and research arenas of interest to adult education. New software packages are available that assist in the inductive analyses that the study of narrative data bases permit.

There is also available an extensive data base made up of the research documentation in various scientific disciplines, including the cognitive sciences (branches of psychology, anthropology, sociology, neurology, linguistics, artificial intelligence, philosophy) as

well as aspects of economics (e.g., human capital theory) and education. At the present time, there is no general synthesis of this extensive research that can inform the work of adult educators and researchers.

Notes and Literature Citations

Pages 1 and 2. Data for Research Note 1 for 1983-1988 from Farmighetti (Ed.).*The World Almanac and Book of Facts, 1994*, Mahwah, NJ: Funk & Wagnalls Corporation, 1993, p. 196; for 1989-1994 from U. S. Bureau of the Census, *Statistical Abstracts of the United States: 1997 (117th edition)*. Washington, DC: 1997, table No. 267; Johnson, A. (1998, August 10)k. Policy Update: *Learning Disabilities and Welfare-to-Work: Part 1 in a Series*. Washington, DC: National Institute for Literacy.

Part 1. Perspective on Adult Education Past and Present

Pages 3 and 4
Enrollment data for Figures 1and 2 for 1965, 1966, 1970, 1974-79 from National Advisory Council on Adult Education (NACAE) (1980, November). *A History of the Adult Education Act*. Washington, DC: NACAE, p. 35; 1967-69, 1971-73 from NACAE (1974, November). *A Target Population in Adult Education*. Washington, DC: U. S. Government Printing Office, p. 52, Chart 1; 1980-88 from Pugsley, R. C. (1990, March). *Vital Statistics: Who Is Served by the Adult Education Programs*. Washington, DC: U. S. Department of Education (USDOE), Office of Vocational and Adult Education (OVAE), Division of Adult Education and Literacy (DAEL)(revised 4/13/90), p. 29; 1989-93 from USDOE/OVAE/DAEL *Undated Fact Sheet*; 1994-96 from USDOE/OVAE/DAEL (1998, January). *Adult Education: Human Investment Impact* 1992-1996, p. 2; data for 1997-99 are linear, extrapolated, estimates.

Funding data for Figures 1 and 2 1965-86 from NACAE (1985). *Annual Report to the President*. Washington, DC: USDOE, pp. 44-47; 1987-88 from Pugsley (op. cit.), p. 32, table 8; 1989-90 USDFOE/OVAE/DAEL *Undated Fact Sheet*; 1991-95 USDOE/ OVAE/DAEL (1998, January). *Adult Education: Human Investment Impact 1992-96*, p. 2; 1996-99 Johnson, A. (1998, June 24). *Policy Update*. Washington, DC: National Institute for Literacy (NIFL).

Data for Table 1. 1966 federal funds from NACAE (1985). *Annual Report to the President*. Washington, DC: USDOE, p. 44; state/local funds and enrollments for 1966 from NACAE (1980, November). *A History of the Adult Education Act*. Washington, DC: NACAE, p. 35; federal funds for 1998 from Johnson, A. (1998, June 24). *Policy Update*. Washington, DC: National Institute for Literacy (NIFL); state/local funds for 1998 from USDOE/OVAE/DAEL (1998, January). *Adult Education and Literacy Data Fact Sheet*, p. 1; 1998 enrollments linear, extrapolated, estimate.

Data for enrollments in ABE, ASE, ESL for 1980 from Pugsley (op. cit.) p. 29, Table 2; for 1996 from USDOE/OVAE/DAEL (1998, January). *Adult Education and Literacy Data Fact Sheet*, p. 2.

Pages 5, 6, and 7
Demographics: NACAE (1981, July). *Report 80*. Washington, DC: NACAE, p. 22); USDOE/OVAE/DAEL (1998, January). *Adult Education and Literacy Data Fact Sheet*, p. 2; National Education Goals Panel. (1997). *The National Education Goals Report: Building a Nation of Learners*, 1997. Washington, DC: U. S. Government Printing Office, p. 58; Kirsch, I., Jungeblut, A., Jenkins, L. & Kolstad, A. (Eds.) (1993). *Adult Literacy in America: A First Look at the Results of the National Adult Literacy Survey*. Washington, DC: National Center for Education Statistics, U. S. Department of Education.

Gender and age of adult education participants: gender data for 1970 from NACAE (1980, November). *A History of the Adult Education Act*. Washington, DC: NACAE, p. 35; for 1980 from Pugsley (op. cit.) p. 30, Table 4; for 1993 from USDOE/OVAE/DAEL (1995, March). *National/State Comparative Profiles (Program Year 1992-1993)*, p. 1; age data from 1976-1979 from NACAE (1980, November). *A History of the Adult Education Act*. Washington, DC: NACAE, p. 35; for 1981 from NACAE (1984, March). *Opening Doors for Success: FY-83 Annual Report to the President of the United States*. Washington, DC. NACAE, p. 44; for 1988 from Pugsley (op. cit.) p. 31, Table 5; for 1996 from USDOE/OVAE/DAEL (1998, January). *Adult Education and Literacy Data Fact Sheet*, p. 2.; age & gender interaction data from Pugsley (op. cit.) p. 8, Figure 6.

Ethnicity of adult education participants: data for 1979 from NACAE (1981, July). *Report 80*. Washington, DC: NACAE, p. 34; for 1993 from USDOE/OVAE/DAEL (1995, March). *National/State Comparative Profiles (Program Year 1992-1993)*, p. 1.

Unemployment and public assistance. Data for unemployment rates in Figure 3 for 1970-1992 from *The World Almanac and Book of Facts, 1994*, Mahwah, NJ: Funk & Wagnalls Corporation, 1993, p. 130; for 1993-96 from Alsop, R. J. (Ed.). *The Wall Street Journal Almanac 1998*. New York: Ballintine Books, p. 157. Data for Table 2, U. S. employment rates from Figure 3; data for adult education programs for 1980 from NACAE (1982, July). *The 1981 Annual Report to the President of the United States*. Washington, DC: NACAE, p. 41; for 1981from NACAE (1994, March). *Opening Doors for Success*. Washington, DC: NACAE, p. 45; for 1989-93 USDOE/ OVAE/ DAEL *Undated Fact Sheet;* Orem, R., Giordano, M. & Hunsaker, P. (1996) *Adult Basic Education in Illinois: Perceptions from Stakeholders and the Public*. Belleville, IL: The Illinois Adult and Continuing Educators Task Force.

Page 8
Data for Table 3 from: Organization for Economic Co-operation and Development (OECD). *Literacy Skills for the Knowledge Society: Further Results from the International Adult Literacy Survey*. Paris: OECD, p. 151, Table 1.2-Prose Scale.

Part 2: Social, Science, Economic, and Technology Trends

Pages 9, 10, and 11
Demographics data for population growth, gender, age and race/ethnicity from 2000 to 2010 from U. S. Census data files accessible via the Internet; immigration data of Table 4 from Farmighetti (Ed.)*The World Almanac and Book of Facts, 1994*, Mahwah, NJ: Funk

& Wagnalls Corporation, 1993, p. 370; remaining immigration data including figure 4 from Bureau of Immigration and Naturalization files for 1996 available via Internet. Educational attainment data are from U. S. Census files accessible via the Internet.

Pages 12, 13,14,15, and 16
Data for Figure 6 from Sticht, T. (1987). *Functional Context Education: Workshop Resource Notebook*. El Cajon, CA: Applied Behavioral & Cognitive Sciences, Inc., p. 1.1 and Kirsch, I., Jungeblut, A., Jenkins, L. & Kolstad, A. (Eds.) (1993). *Adult Literacy in America: A First Look at the Results of the National Adult Literacy Survey*. Washington, DC: National Center for Education Statistics, U. S. Department of Education.

Data for general trends for last 75 years from Sticht, T. & Armstrong, W. (1994, February) *Adult Literacy in the United States: A Compendium of Quantitative Data and Interpretive Comments*. Washington, DC: National Institute for Literacy; Waters, B. et al. (1988, October). *Estimating the Reading Skills of Military Applicants: Development of an ASVAB to RGL Conversion Table*. HumRRO Final Report 88-22, FR-PRD-88-22. Alexandria, VA: Human Resources Research Organization; Wiley, T. (1996). *Literacy and Language Diversity in the United States*. McHenry, IL: Delta Systems Co., Inc.

Data for trends in setting standards for adult literacy, Figure 7 from Organization for Economic Co-operation and Development (OECD). (1997) *Literacy Skills for the Knowledge Society: Further Results from the International Adult Literacy Survey*. Paris: OECD, p. 151, Table 1.2-Prose Scale; Kolstad, A. (1996, April) *The Response Probability Convention Embedded in Reporting Prose Literacy Levels from the 1992 National Adult Literacy Survey*. Washington, DC: National Center for Education Statistics; Kolstad, A. et. al. (1998, May) *The Response Probability Convention Used in Reporting Data From IRT Assessment Scales: Should NCES Adopt a Standard?* Washington, DC: National Center for Education Statistics.

Citations for brain development in children and adults. Clinton, H. R. (1996) *It Takes a Village and Other Lessons Children Teach Us*. New York: Simon & Schuster, pp. 57-58; Bruer, J. (1997, November) Education and the Brain: A Bridge Too Far. *Educational Researcher, 26*, 4-16; Bruer, J. (1998, November) Let's Put Brain Science on the Back Burner. *NASSP Bulletin, 82*, 9-19.

Pages 16, 17, 18, and 19
Citations for cognitive science and the literacy development of adults. Neisser, U. (1997, September-October) Rising Scores on Intelligence Tests. *American Scientist, 85*, 440-447; Sticht & Armstrong (op. cit.) pp.17-40; Hunt, E. (1995, July-August). The Role of Intelligence in Modern Society. *American Scientist, 83*, 356-368; Gottfredson, L. (1997) Why g Matters: The Complexity of Everyday Life. *Intelligence, 24*, 79-132; Sternberg, R. (1998) Abilities are Forms of Developing Expertise. *Educational Researcher, 27*, 11-20. Cattell, R. (1983) Intelligence and National Achievement. Washington, DC: The Cliveden Press, p. 23; Healy, A. & McNamara, D. (1996) Verbal Learning and Memory: Does the Modal Model Still Work? In J. Spence, J. Darley, & D. Foss (Eds.), *Annual Review of Psychology: Volume 47* (143-172). Palo Alto, CA : Annual Reviews, Inc.;

Venezky, R. (1992, May) *Matching Literacy Testing with Social Policy: What Are the Alternatives?* Philadelphia, PA: National Center on Adult Literacy, p. 4.; Ackerman, P. (1996) *A Theory of Adult Intellectual Development: Process, Personality, Interests, and Knowledge*. Intelligence, 22, 227-257.

Data for Figure 8 for the telephone survey are from Sticht, T., Hofstetter, & Hofstetter (1996) Assessing Adult Literacy By Telephone. *Journal of Literacy Research, 28*, 525-559; data for the NALS are from Kirsch, et al (op. cit.).; data for figure 9 are constructed from data in Sticht & Armstrong (op. cit.).

Citations for the social basis of cognition and intergenerational transfer: Sticht, et. al. (1974) Auding and Reading: A Developmental Model. Alexlandria, VA: Human Resources Research Organization; Hirsch, E. (1996) *The Schools We Need and Why We Don't Have Them*. New York: Doubleday, pp. 146-147; Chen, R. & Vellutino, F. (1997) Prediction of Reading Ability: A Cross-Validation of the Simple View of Reading. *Journal of Literacy Research, 29*, 1-24; Hart, B. & Risley, T. (1995) *Meaningful Differences in the Everyday Experience of Young American Children*. Baltimore, MD: Paul H. Brooks Publishing Co.; Snow, C., Burns, S. & Griffin, P. (1998) *Preventing Reading Difficulties in Young Children*. Washington, DC: National Academy of Sciences.

Pages 20, 21, and 22
Citations for economic trends. Organization for Economic Co-operation and Development (OECD). (1997) *Literacy Skills for the Knowledge Society: Further Results from the International Adult Literacy Survey*. Paris: OECD, pp. 39-60; Judy, R. & D'Amico, C. (1997) *Workforce 2020: Work and Workers in the 21st Century*. Indianapolis, IN: Hudson Institute; Phillips, J. (1970, April) *The Use of Training Time Information in Planning and Evaluating Manpower Programs*. Los Angeles, CA: California Occupational Analysis Field Center; Murnane, R. & Levy, F. (1996). *Teaching the New Basic Skills*. New York: The Free Press; Lesgold, A., Feuer, M., & Black, A. (1977) *Transitions in Work and Learning*. Washington, DC: National Academy Press; Raudenbush, S. & Kasim, R. (1998) Cognitive Skill and Economic Inequality: Findings from the National Adult Literacy Survey. *Harvard Educational Review, 68*, 33-68; Organization for Economic Co-operation and Development (OECD) (op. cit.); ibid.

Pages 23, 24, 25,26, and 27
Health trends: Mirowsky, J. & Ross, C. (1998) Education, Personal Control, Lifestyle and Health. Research on *Aging, 20*, 415-449.

Technology trends: Telephone surveys. See reports of the National Household Education Survey that use telephone survey methods conducted by the National Center for Education Statistics in Washington, DC; Kent, J. & Plomin, R. (1987) Testing Specific Cognitive Abilities by Telephone and Mail. *Intelligence, 11*, 391-400; Sticht, T., Hofstetter, & Hofstetter (1996) Assessing Adult Literacy By Telephone. *Journal of Literacy Research, 28*, 525-559

Television. Schwartz, M. (1992, June) *Television and Adult Literacy: Potential for Access to Learning for an Unserved Population.* A Report Submitted to the Ford Foundation. This report helped stimulate the development of the *Crossroads Café* program for English-as-a-Second-Language (ESL).

Computers. Data on growth of computer use in the public schools from U. S. Bureau of the Census, Statistical Abstract of the United States: 1997 (117th edition.) Washington, DC: 1997; data for figures 11 and 12 from U. S. Census files accessible via the Internet; data on Internet growth from Network Wizards via the Internet.

Distance learning. Information from various sources via the Internet, including the WWW page for the U. S. Department of Education. Also see Imel, S. (1996). *Trends and Issues. Distance Education.* ERIC Clearinghouse for Adult, Career, and Vocational Education; Kerka, S. (1995) *Trends and Issues Alert. Access to Information: To Have and Have Not.* ERIC Clearinghouse for Adult, Career, and Vocational Education.

Part 3. Government and Legislative Trends

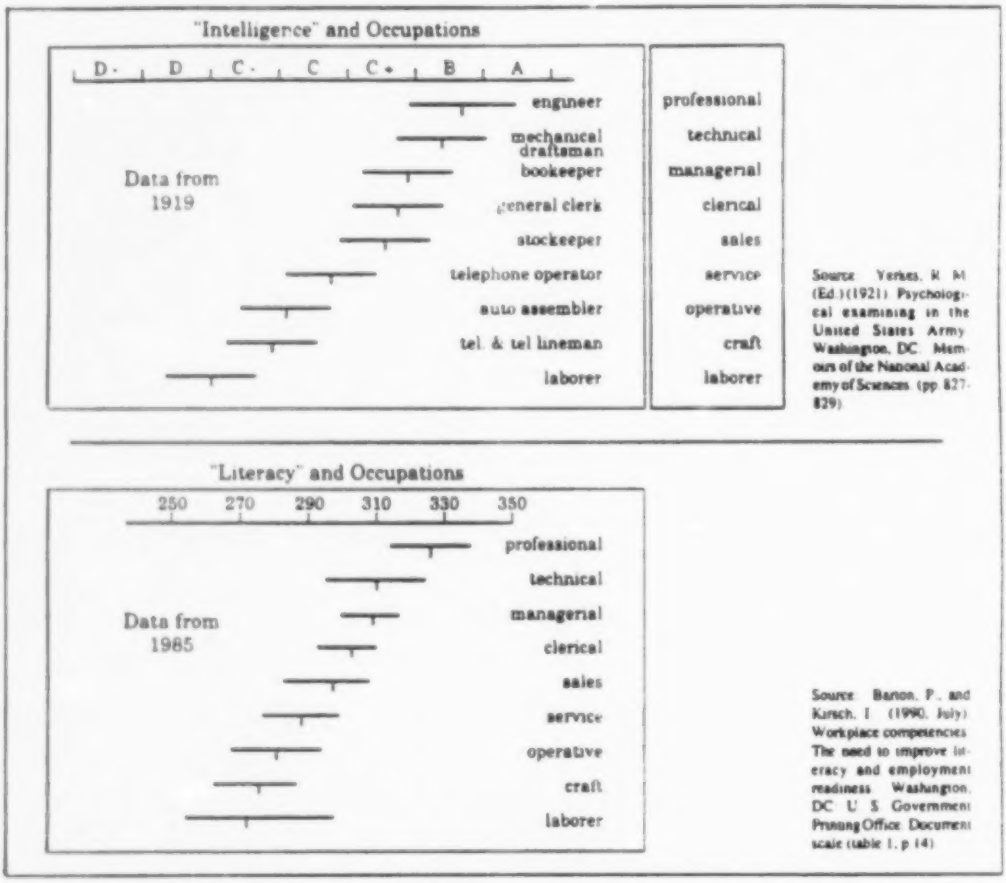
Pages 27, 28, 29, and 30
Donahue, J. (1997) *Disunited States.* New York: Basic Books ; Strawn, J. (1998, April) *Beyond Job Search or Basic Education: Rethinking the Role of Skills in Welfare Reform.* Washington, DC: Center for Law and Social Policy; Barton, P. (1998) *Toward Inequality.* Princeton, NJ: Educational Testing Service; Sticht, T. (1998, April) *Moving Adult Literacy Education From the Margins to the Mainstream of Educational Policy and Practice.* Paper prepared for the International Conference on How Adults Learn, Washington, DC: Georgetown University Conference Center; The Commission on the Skills of the American Workforce (1990, June) *America's Choice: High Skills or Low Wages.* Rochester, NY: National Center on Education and the Economy.

Part 4. High Priority Planning Issues

Pages 31 and 32
Barton, P. (1998) *Toward Inequality.* Princeton, NJ: Educational Testing Service; Sticht, T. (1998, April) *Moving Adult Literacy Education From the Margins to the Mainstream of Educational Policy and Practice.* Paper prepared for the International Conference on How Adults Learn, Washington, DC: Georgetown University Conference Center; The Commission on the Skills of the American Workforce (1990, June) *America's Choice: High Skills or Low Wages.* Rochester, NY: National Center on Education and the Economy. Jurmo, P. (1998, June) *Integrating Adult Basic Education With Workforce Development and Workplace Change: How National-Level Policy Makers Can Help.* East Brunswick, NJ: Learning Partnerships.

Research Note: Cognitive Abilities and Occupational Status Across 75 Years

The figure below shows that whether one calls adult cognitive abilities "intelligence," as in 1919 during World War I, or "literacy," as in 1986 when the profile of adult literacy was published, the distributions of cognitive skills in different occupational categories remains the same. The least skilled are found more often in the lower-status, lower paying occupations, which typically demand less education, while the more highly skilled are found in the higher-status, better paying, more educationally demanding occupations. Interestingly, during World War I over a quarter of "laborers" had their "intelligence" assessed using the Beta test for illiterates or non-English speakers. The 1985 young adult literacy survey used a literacy test for all those surveyed (non-English speaking were excluded). The fact that a literacy-based test could be given to almost all young adults, including "laborers," in 1985 reflects the fact that considerable gains have been made in rendering the population of adults literate in the last three-quarters of a century. Despite this, the least skilled still occupy the lower rungs of the occupational ladder. This is a situation that is likely to persist well into the new millennium.



Note: The small, vertical marks indicate the mean and the horizontal lines around each mean indicate plus and minus one standard deviation around the mean.